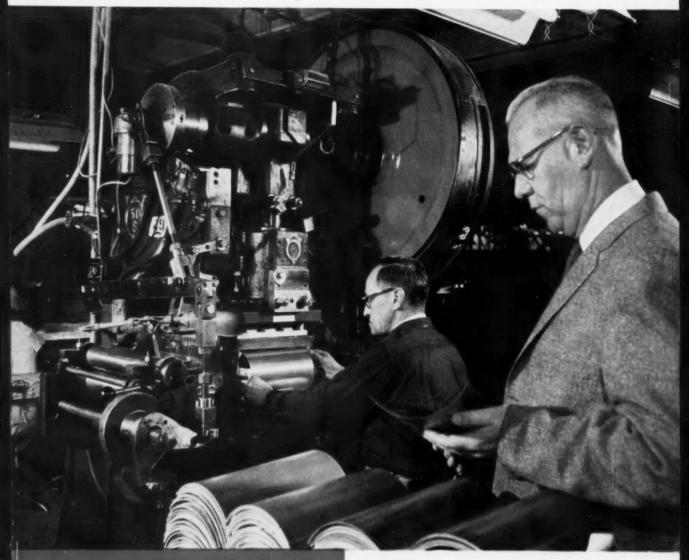
The IRON AGE

June 26, 1958

A Chilton Publication

The National Metalworking Weekly



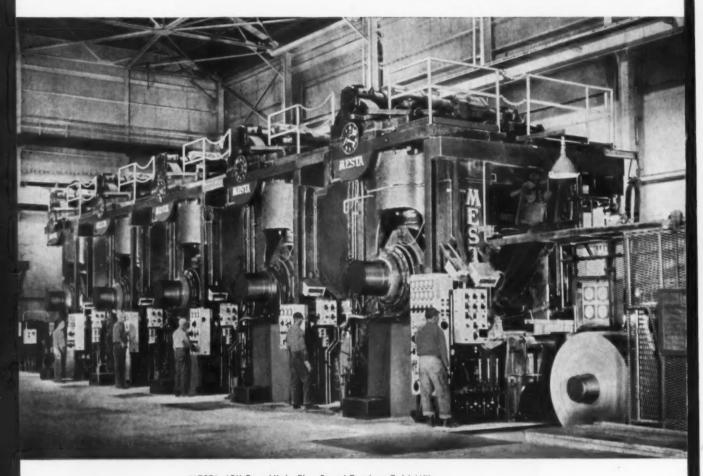
How To Get More
For Your Plastics
Dollar P. 81

What Gripes Workers
About Union Policies - P. 51

Brass Mills Revamp Sales Strategy - P. 56

Digest of the Week P. 2-3

MESTA Cold Mills



MESTA 48" Four-High, Five-Stand Tandem Cold Mill Rolling Strip Steel for Tin Plate in Coils



Designers and Builders of Complete Steel Plants

MACHINE COMPAN

PITTSBURGH, PENNSYLVANIA



Zinc coating holds tight on sheets drawn 4½ in. deep

Here you see a part of the housing of a room air-cooler. The cooler is of the evaporative type, and the ever-present moisture makes rust a continual threat. For this reason the manufacturer decided to make the housings of rustresisting galvanized sheet steel, with an enamel finish baked on. But the whole idea depended on the ability of galvanized steel to be deep-drawn without faulting the zinc coating.

RIGHT DUCTILITY AND STIFFNESS

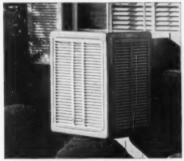
A trial showed that Bethcon galvanized sheets would successfully take the draws, some of which were 4½ in, at one blow. The reason for this success lies in the fact that Bethcon is galvanized by our unique continuous process,

a process which does two wonderful things to a Bethcon sheet:

 It bonds the zinc so tightly to the sheet that the zinc won't flake off even in severe forming operations.
 It imparts to the sheet an ideal blending of ductility and stiffness,

blending of ductility and stiffness, so that deep-draws can be made without sacrificing rigidity in the product.

Industry is discovering all sorts of interesting ways in which Bethcon continuously galvanized sheets can help make products better, more economically. Where you need the strength of steel, coated for corrosion-resistance, you're likely to find Bethcon a new answer to your problem. Why not discuss it with a Bethlehem representative?



This cooler is in wide use for homes, trailers, industrial and public buildings. For maximum rust-protection, unit is cased in Bethcon galvanized sheet steel, primed with zinc-chromate and finished in baked enamel.

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June 26, 1958-Vol. 181, No. 26

Digest of the Week in

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INSIDE RUSSIA

Editor Reports — IRON AGE Editor George Sullivan tells about his 6000-mile tour of the USSR, and his talks with Red steel men from Kiev to Siberia.

BRASS MILLS

New Approach - Top management has shifted its thinking to



more basic, long-range problems. And they are starting to come up with the answers that spell better sales ahead. P. 56

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Industry Trend — U. S. Steel's plans for ore sintering show how steel industry can raise capacity without building new furnaces.

Metalworking

PLASTICS TEAM: Two officials of Continental - Diamond Fibre Corp., T. R. Silk (r), Plant Manager, and E. Crowe, General Foreman, check trimming operation on copper bonded to epoxy laminate. It's just one of many cases where plastics combine with metals. P. 81

High percentage of ore fines also make sintering a necessity. P. 60

HIGHWAY OBSOLESCENCE

Is More Planning Needed? —
New highways being built may grow old much faster than expected. GM expert says not enough study is going into road designs.
Too often, safety is sacrificed for economy.

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FEATURE ARTICLE

HOW TO GET MORE FOR YOUR PLASTICS DOLLAR

Where Plastics Fit — True, plastics and metals compete. But it's also a fact that they complement each other. Many of the advances of the past decade owe their existence to the two materials working together. It points up the need to know more about the properties and uses of the plastics family. P. 81

Thermosetting Types—There are six major types of thermosetting plastics — the caseins, epoxies, melamines, phenolics, polyesters, and ureas. Metalworking meets them in the form of finishes, laminates, and plastic tooling.

P. 83

Thermoplastics Offer—The other large group of plastic materials, the thermoplastics, includes acrylics, cellulosics, fluorocarbons, nylons, polyethylene, polypropylene, polystyrene, and vinyls. These

are the volume materials that show up most in the field. P. 87

How to Process—Since plastics differ widely in chemical composition, properties, and end uses, it's to be expected that they differ in methods of manufacture. The major processes are molding, casting, extrusion, coating, calendering, sheet forming, laminating, postforming, machining and finishing.

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Versatile Laminates — Impregnating and laminating paper, cloth, fibers or metals with plastics creates a whole new family of materials. High strength, light weight, and heat and corrosion resistance make them candidates for jobs that even metals can't handle.

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MARKETS & PRICES

EXPORT MARKETS

Profit for Small Firms—Foreign markets offer a golden opportunity to enterprising U. S. companies. To develop them, management must be willing to invest time and to trade in good faith.

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STEEL PRICE HIKE

Due for Delay — The odds are 100 to 1 there will be a steel price increase after July 1. Before U. S. Steel finally decides its price policy, the summer will be well under way. When it does come the increase may amount to \$5 a ton. P. 58

RED TRADE

Makes Friends — U. S. S. R. economic program is winning victories over the U. S. around the world. Reds sacrifice economics for politics in aid and trade programs.

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LABOR'S MOVE

Will It Decide Prices? — U. S. Steel has put labor on the spot. In effect, it told the steel union that no price hike will come if labor foregoes its July 1 wage boost.

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FASTENER PRICES

Increase Coming?—If the cost of steel goes up as expected, fastener makers will raise their own prices correspondingly. An increase of 5 pct or so would about offset recent price cutting.

P. 114

NEXT WEEK SMALL ENGINE MARKET

Growing Fast—More leisure time and a general rise in living standards has created big demand for outboard engines, power mowers, garden tractors and other equipment. Next week's special report will analyze this growing market.



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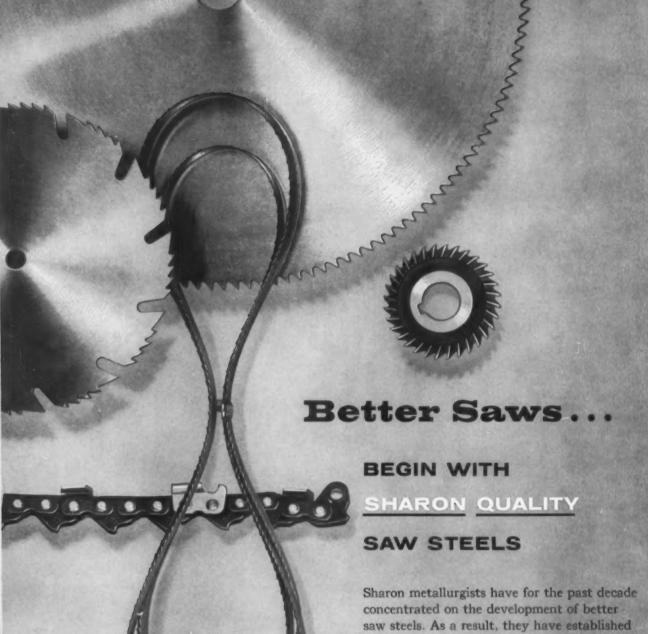


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Labor's Crossroads: It Is Plainly Marked Now

For the first time since the war ended, management is no longer over the barrel on wage matters. It may look that way in a few industries, but in most the shoe is on the other foot.

This period—and those immediately ahead—will tell whether we have labor leaders or labor statesmen. For the past 12 years management has been forced by tremendous labor pressure to give wage and fringe increases which have been far beyond productivity improvements.

The only way this could be done, after strikes and pressure from Washington forced management's hand, was to raise prices to make up for part of the increases and to invest in new machinery to make up the balance. The result has been inflation in prices for the simple reason that wages went up too fast and too often.

The more serious losers in this tragic comedy of errors are pensioners, government employees, and white collar workers. Other losers are professional people, engineers, and middle management. It should be clear that when 15 million out of a total labor force of 66 million exert such power and monopoly as we have seen, they get theirs at the expense of others.

The opportunity which management has been

waiting for is here. Now is the time to set up detailed counter demand patterns in all industries. Collective bargaining is based on the facts of life, not upon wishes and aims of social workers and publicity handouts.

Many labor leaders privately are of the opinion that it will be tough going in the next year or so. Management should understand now that when there is a major pickup in business the labor pressure will be on again. If there ever was a time to halt excessive wage and fringe increases it is now and during next year. It may cause strikes and hard bargaining, but it will be worth it if the economy is to be spared one inflationary binge after another.

Of course management will be accused of all kinds of things if it puts up a stiff and intelligent front. But after all, labor has been putting up that kind of front since 1948 and earlier. There has never been any hesitation for one union to go down the line for another one in the fight to wring all the traffic would bear from company after company.

Labor is at the crossroads: Let's hope it takes the right road—with some prodding by management.

Tom Campbell

Editor-in-Chief



FOR SPEED AND STRENGTH, prominent builders depend on HOBART No. 10 ELECTRODES

Photo shows seven of nine arc welded rigid frames in place for the new University of Tennessee Armory and Field House. The eighth frame is being assembled on the ground in back of the bulldozer. After the seven shop fabricated sections were joined with Hobart No. 10 electrodes and every weld joint X-rayed, the 571/2 ton rigid frame unit was lifted into place by four 30 ton motor cranes. Considerable time and money was saved by assembling, welding and X-raying each rigid frame on the ground and erecting it as a unit.

The roof frame of this clear span structure is just as clean cut as the floor frame; no trusses, no bracing to

clutter up the graceful outline of the structure and, consequently, no obstruction to light or the spectator's view of the performance. Size of the framework for the building is 220 feet long and 208 feet wide. Height of framework at center is 64 feet. The building, when completed, will have 7,000 permanent and 3,000 temporary seats.

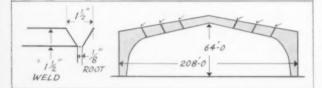
Seven shaped beam and column sections for each rigid frame were fabricated in the shops of Tucker Steel Corp., Knoxville, Tenn., and trucked to the job site. The bulk of the work was done at the fabricating shop for speed

and economy.

Erection time for the framework was 63 days. Six welding operators used over 2 \(\frac{1}{4} \) tons of Hobart No. 10 electrodes to make the field splices. Current was supplied by six 300 ampere portable gasoline engine driven welders. Every welded joint was X-rayed by Pittsburgh Testing Laboratory, Birmingham, Alabama.

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Workers Help Sell

Sir—I read with interest your Special Report, "How Workers Help Management Compete for New Business," appearing in the June 5 issue. I would appreciate it very much if you would let me have ten copies of this reprint for internal distribution.— C. Claus, Vice Pres., The Babcock & Wilcox Co., New York, N. Y.

Sir—We should appreciate six copies if available . . . Thank you.

—E. L. Casey, Exec. Vice Pres.,
M. H. Treadwell Co., Inc., New York, N. Y.

Sir—We are especially interested—would like to obtain as many copies as possible for distribution to our superintendents.—W. L. Damkoehler, Works Mgr., Allis-Chalmers Mfg. Co., Gadsden, Alabama.

Sir—. . . A copy to us at your earliest convenience.—H. W. Pearcy, Pres., Percival Steel & Supply Co., Los Angeles, Calif.

Sir—We would appreciate having a copy by return mail. — C.L. Waterman, Pres., The Union Forging Co., Endicott, N. Y.

Sir—At your earliest convenience . . . C. K. Gumbert, Administrator of Industrial Relations, Pittsburgh Forgings Co., Coraopolis, Pa.

Planned Maintenance

Sir—Please mail a copy of your article: "Reduce Costs and Boost Profits with Planned Maintenance" (May 29, 1958). I liked the article and would like to distribute it to a number of key maintenance supervisors.—P. A. Repino, Plant Engr., Lebanon Steel Foundry, Lebanon, Pa.

Sir-Please send me a reprint.

Thank you.—C. J. Schneider, Senior Industrial Engr., Great Lakes Steel Corp., Ecorse, Detroit, Mich.

Cutting Costs

Sir—Please forward 2 copies of your excellent article "How to Lower Materials Costs" appearing in your May 1, 1958 issue. We found the article very informative.

—F. B. Krafft, Chief Mechanical Engr., Anaconda Wire & Cable Co., Hastings-on-Hudson, N. Y.

Sir—We would appreciate your sending us ten copies to be distributed to our management staff.—R. W. Miner, Asst. to Wks. Mgr., The National Supply Co., Torrance, Calif.

Sir—Please send me a reprint.— P. E. Taylor, Supervisor Cost Reduction, Westinghouse Electric Corp., Raleigh, N. C.

Sir—I would greatly appreciate receiving three reprints. Many thanks.—G. Schwab, Mgr. Operations, Pipe Fabrication Dept., Drayo Corp., Marietta, O.



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FATIGUE CRACKS

Plastics Guide

Plastics users and buyers get a bonanza in this week's IRON AGE. Beginning on p. 81 they'll find the latest in our metalworking dollar series—"How to Get More for Your Plastics Dollar."

Plastics have shown an astonishing rate of progress in the last decade. Output has gone from 1 to 4 billion pounds a year. Sales are expected to reach \$5 billion by 1960.

Yet the term "plastics" is as allembracing as the word "metals." In this 16-page feature article our editors aim to give readers a clearer knowledge of the varied types of plastics, their properties, processing, and use.

You'll find, for example, a discussion on just what a plastic is. There are sections on where to use the thermosetting and thermoplastic types to best advantage. Another part of the article deals with their processing. And finally there are some words on impregnating and laminating other materials with plastics to create new families of materials.

Puzzler Answer

The fish problem was slightly sticky, but here are the winners:

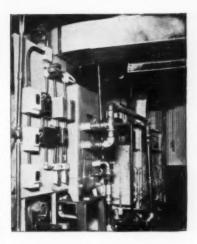
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Dick Hautzenroeder, Massey-Fergason, Inc., Norb. Daugherty and LaVerne Brady of Westinghouse Electric Corp.; W. R. Moss, Chicago Auto Wrecking Corp.; A. M. Handwerker, C & N W Railway Co.; Mrs. Kathleen Wollin, Greatwestern Steel Co.; S. G. Kochis, Blaw-Knox Company; F. G. Forquer, Daystrom Instrument; Wesley C. Cropper, American Steel Band Co.

The answer: 32 inches.



SPECIAL PERMIT: This straddle carrier for handling steel plate didn't get a ticket when it traveled Benton Harbor, Mich., streets. However, the unit on its way to dockside for shipment to Denmark did need a special permit. Built by Clark Equipment Co., it is 12 ft wide, 10 ft high and 19 ft long, lifting and transporting loads weighing up to 30 tons.



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COMING EXHIBITS

Western Packaging & Materials Handling Show — Aug. 11-13, Civic Auditorium, San Francisco. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Chemical Show—Sept. 9-12, International Amphitheater, Chicago. (National Chemical Exposition, 86 E. Randolph St., Chicago 1.)

Western Tool Show—Sept. 29-Oct. 3, Shrine Exposition Hall, Los Angeles. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

Packaging & Materials Handling Show—Oct. 14-16, Coliseum, Chicago. (SIPMHE, 327 S. LaSalle St., Chicago 4.)

Metals Show—Oct. 27-31, Public Auditorium, Cleveland. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Plastic Show—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

MEETINGS

JULY

Truck-Trailer Manufacturers Assn.
—Summer meeting, July 14-16,
Homestead, Hot Springs, Va.
Society headquarters, 710 Albee
Bldg., Washington 5, D. C.

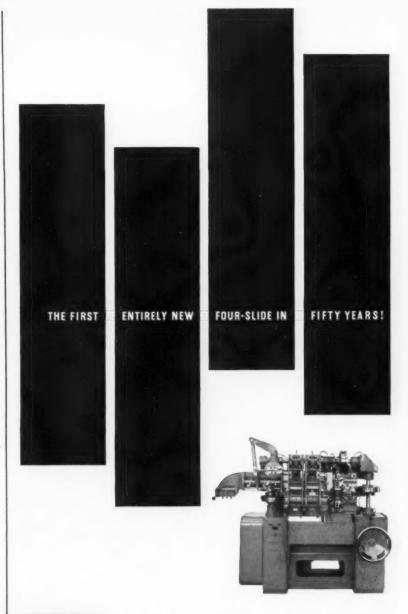
The Material Handling Institute, Inc.—Joint industry fall meetings—Sept. 22-24, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, Suite 759, One Gateway Center, Pittsburgh 22.

SEPTEMBER

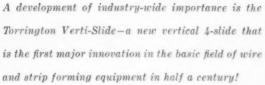
National Petroleum Assn.—Annual meeting, Sept. 10-12, Hotel Traymore, Atlantic City, N. J. Society headquarters, Munsey Bldg., Rm. 958, Washington, D. C.

Steel Founders' Society of America
—Fall meeting, Sept. 22-23, The
Homestead, Hot Springs, Va.
Society headquarters, 606 Terminal
Tower, Cleveland 13.

(Continued on P. 16)







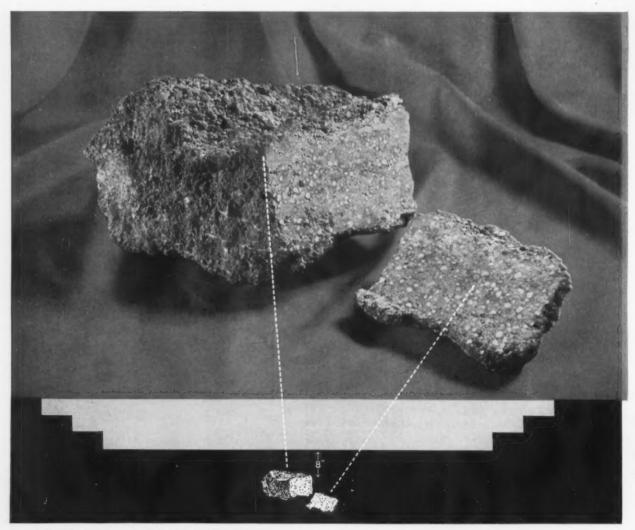


The Verti-Slide was designed to meet a serious need for greater versatility, lower tooling cost, faster setup time and reduced floor space. We urge you to investigate the new Torrington Verti-Slide in detail.

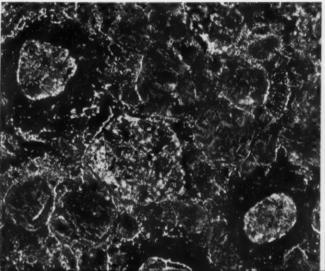
THE TORRINGTON MANUFACTURING COMPANY

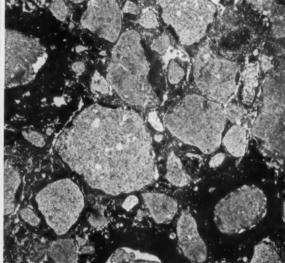
TORRINGTON. CONNECTICUT . VAN NUYS, CALIFORNIA . OAKVILLE, ONTARIO

Permanente 165 Bottom as tough as new after 3½ years service



Unreteached phetograph of actual specimens taken from 8 inches below working surface of Open Hearth bottom at center of furnace opposite #2 door. Furnace has 265 ton capacity and an operating rate of 10 hours and 45 minutes. 587,010 tons of regular carbon steel were tapped on this bottom.





These photomicrographs (enlarged 15 times) were taken from a thin section and show the mineralogical and textural characteristics typical of the complete specimen.

The coarser grains show no signs of having been altered or corroded during the 3½ years service period. The bond between coarser grain and matrix appears strong.

The fine matrix portion, although penetrated by calcium, has not been deteriorated. In fact, the filling of voids by calcium

These specimens of Permanente 165 Ramming Mix were taken from eight inches below the rammed working surface of an Open Hearth furnace at a major steel plant. They were then submitted to Kaiser Chemicals research laboratories for chemical analysis and petrographic examination.

Here, briefly, are the findings of the laboratory tests:

- 1. The specimens are in excellent condition, with the components firmly bonded together.
- 2. Except for minor amounts of calcium and traces of other compounds, the specimens have not been significantly penetrated or contaminated by components of furnace charge or slag.

CHEMICAL ANALYSIS: The results of the chemical analysis of the specimen are tabu-Moisture loss (110°C for 2 hours) . Ignition loss (1000°C for 1 hour on dried sample) . . 0.92 Typical Analysis . 3.02 2.4 0.94 1.0 Fe₂O₃ . . . 0.70 0.6 Al₂O₈ 0.58 0.3 CaO . . 1.1 MgO (by diff.) 87.34 94.6

These tests confirm once again the reasons why Permanente 165 Ramming Mix lasts longer than other materials . . . requires fewer repairs and less down time . . . helps produce greater tonnage at lower bottom cost.

Permanente 165 is made from high purity Kaiser Periclase refractory grains (94-96% MgO), and ceramically bonds itself into a crystalline mass at relatively low temperatures. This produces a bottom with maximum resistance to hydration and attack by iron oxide and slag. Its installed high density—averaging 175 pounds per cubic foot—assures longer life.

Why not ask your Kaiser Chemicals Sales Engineer to show you how this superior ramming mix can help you get greater steel tonnage at lower bottom cost?

Call or write Kaiser Chemicals Division, Dept. S-8122, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

PITTSBURGH 22, Pa. . . 3 Gateway Center Hammond, Ind. . . . 518 Calumet Building Oakland 12, Calif. 1924 Broadway



PIONEERS IN MODERN BASIC REFRACTORIES

REFRACTORY BRICK AND RAMMING MATERIALS • CASTABLES & MORTARS
MAGNESITE • PERICLASE • DEADBURNED DOLOMITE • ALUMINAS

STEELS, INC.

Union, New Jersey • Detroit, Michigan • Melrose Park, Illinois

EXHIBITS, MEETINGS

(Continued from P. 13)

Air Moving & Conditioning Assn., Inc.—Annual meeting, Sept. 22-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 2159 Guardian Bldg., Detroit 26.

Porcelain Enamel Institute — Annual meeting, Sept. 25-27. The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 1145 19th St., N. W., Washington, D. C.

The Electrochemical Society, Inc.— Semi-annual meeting, Sept. 28-30 and Oct. 1-2, Chateau Laurier, Ottawa, Canada. Society headquarters, 1860 Broadway, N. Y.

Pressed Metal Institute — Annual meeting, Sept. 28-Oct. 2, The Cloisters, Sea Island, Ga. Society headquarters, 3673 Lee Rd., Cleveland 20.

OCTOBER

National Assn. of Sheet Metal Distributors—Fall meeting, Oct. 5-8, Marlborough Blenheim Hotel, Atlantic City. Society headquarters, 1900 Arch St., Philadelphia.

Truck Body & Equipment Assn., Inc.—Annual convention and exhibit, Oct. 6-8, Ambassador Hotel, Atlantic City. Society headquarters, 1616 K St., N. W., Washington, D. C.

Gray Iron Founders' Society, Inc.
—National annual meeting, Oct.
8-10, Sheraton-Park Hotel, Washington. Society headquarters, 930
National City-E 6th Bldg., Cleveland.

The Wire Assn.—Annual convention, Oct. 13-16, Chalfonte-Haddon Hall, Atlantic City. Society head-quarters, 543 Main St., Stamford, Conn.

American Machine Tool Distributors' Assn.—Annual meeting, Oct. 15-17, Sheraton Plaza, Boston. Society headquarters, 1900 Arch St., Philadelphia.

Rail Steel Bar Assn.—Semi-annual meeting, Oct. 20-22, Blackstone Hotel, Chicago. Society head-quarters, 38 S. Dearborn St., Chicago.

ALLEN-BRADLEY Luabity Reduced Voltage Motor Starters

AUTOMATIC GRAPHITE RESISTOR TYPE

Graphite disc resistors are automatically inserted in series with the squirrel cage motor at starting. These resistors can be steplessly adjusted for motor and load conditions, resulting in remarkably smooth acceleration of the motor.

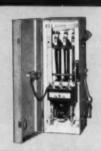
BULLETIN 740



MANUAL STEPLESS RESISTANCE TYPE

Graphite compression disc resistors provide smooth, stepless starting of polyphase squirrel cage motors—prevent lamp flicker. Operated by a hand lever, the smooth starting of the motor is under the control of the operator.

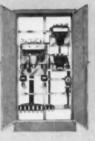
BULLETIN 640



AUTOMATIC MULTIPOINT RESISTANCE TYPE

Meets power company starting current rules on network systems. Resistors are automatically inserted in the line at starting, and are short circuited in steps at definite time intervals which can be adjusted from 1 to 5 seconds.

BULLETIN 741



MANUAL AUTOTRANSFORMER TYPE

Recommended where the characteristics of the driven load or power company rules require reduced voitage starting. Double break, silver alloy contacts are standard for air-break starters...copper contacts for oil-immersed units.

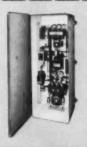
BULLETIN 646



AUTOMATIC STEPLESS GRAPHITE RESISTOR TYPE

The ultimate in velvet smooth acceleration of squirrel cage motors. Lamp flicker on network systems used for both power and light is eliminated. The graphite disc resistors are compressed automatically . . . smoothly and steplessly.

BULLETIN 742



AUTOMATIC PART-WINDING TYPE

For use with squirrel cage motors having two separate parallel stator windings. Two types—Style A, two step starter; Style B, three step starter having resistance in series with motor on the first step.

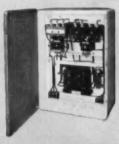
BULLETIN 736



AUTOMATIC AUTOTRANSFORMER TYPE

Utilizes an autotransformer connected in open delta to reduce line voltage for starting squirrel cage motors. Taps are provided on the autotransformer to adjust the voltage applied to the motor.

BULLETIN 746



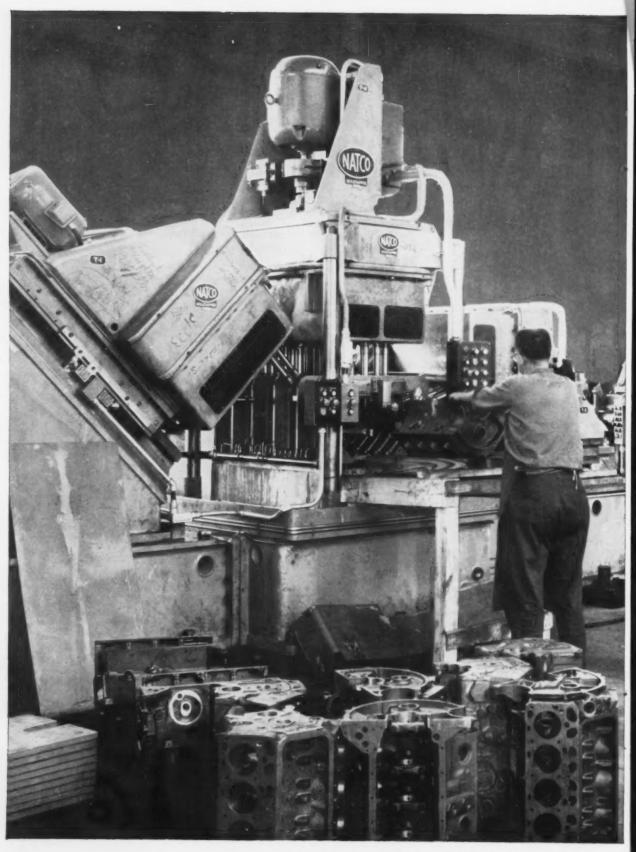


The Sign of QUALITY

ALLEN-BRADLEY

MOTOR CONTROL

Allen-Bradley Co., 1315 S. First St., Milwaukee 4, Wis. In Canada: Allen-Bradley Canada Ltd., Galt, Ont.





Must your transfer machine go to scrap every time your model changes?

Certainly not. For example, the way-type machines shown here were once stations in an automated straightline transfer machine. Now they will begin their second life as individual machines on a shorter-run lowerproduction assignment.

Each station in your Natco transfer machine—whether drilling, boring, milling, sawing or chamfering—is a machine tool in its own right. With modifications and new tooling, it may serve you for many years beyond its original "single-purpose" life.

When product changes call for new tooling, consider adapting the previous machinery to a new use—and realize substantial savings. Natco engineers and manufacturing facilities are at your disposal to make the necessary modifications. Call your nearby Natco representative today to discuss converting your equipment.

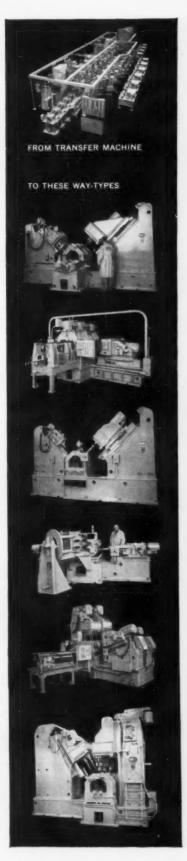


Multiple-spindle drilling, boring, facing and tapping machines. Special machines for automatic production.

NATIONAL AUTOMATIC TOOL COMPANY, INC.

Dept. 294-C, Richmond, Indiana

Natco offices in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles. Distributors in other cities.



CHAMBERSBURG

FORMING DROP

a <u>new</u> profit maker for coining, embossing or forming operations

> The new Chambersburg Forming Drop is an electrically controlled, air-operated, piston-lift, gravity drop hammer, designed for precision blow control. It makes possible faster, safer, almost effortless, more efficient production on forming, cold striking, coining and embossing operations requiring a single blow in a single die impression-operations common to coining presses, strap hammers, pneumatic drop hammers, etc.

> The Forming Drop may be fed and operated manually, but, due to its electrical control, it is readily adaptable to semi-automatic or completely automatic operation.

The Forming Drop may hold possibilities for you. Write or phone for further details.









HAMBERSBURG

FORMING-DROP

CHAMBERSBURG, PA.

CHAMI























"...AND WEIRKOTE" CAN DO AWAY WITH PLATING OR DIPPING AFTER FABRICATION! IT WON'T PEEL OR FLAKE."

- Q. A zinc-coated steel that won't peel or flake? That could save us a lot of money every month. Just what makes this Weirkote so special?
- A. It's made by the continuous process, you know, which integrates zinc and steel so that the toughest fabrication won't break down the bond. You can work Weirkote to the very limits of the steel itself.
- Q. Of course, that means the most complicated parts would have protection against rust. I like what I'm hearing. Is there more?
- A. Yes... now Weirkote is treated to inhibit wet storage stain (white oxide). To make a long story short, I'd say this: With Weirkote, you can turn out a better product at lower cost. And you can free a lot of the capital, floor space and time you have tied up in plating operations.

Send for free booklet that details the time- and cost-saving advantages of skin-tight zinc-coated Weirkote. Weirton Steel Company, Dept. A-7, Weirton, West Virginia.

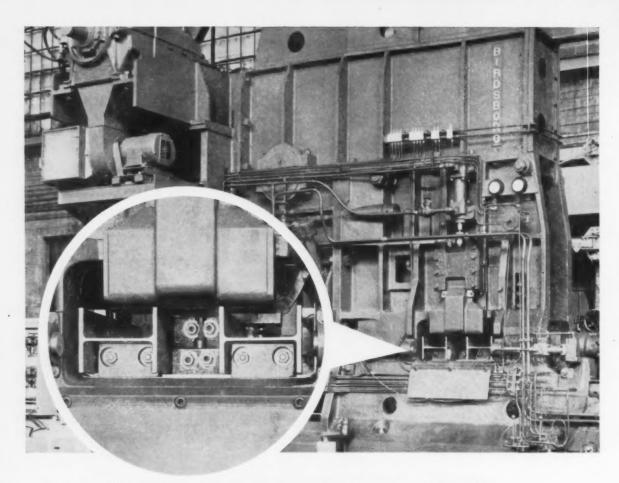


WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

e division of





New **BIRDSBORO**-design shear cuts wide range of steel beams...eliminates deburring

The unique design of this Birdsboro universal structural shear completely eliminates sawing of beams and the costly hand work required to remove burrs. It is the first of its kind built in the United States.

Check these features:

- ✓ Superior, rapid cutting action . . . through unique figure 8 motion of moving knives
- ✓ Cuts all standard I-beams, wide flange beams, · channels and angles
- ✓ No burrs . . . eliminates costly hand deburring
- ✓ Flexible . . . can be adjusted to cut two beams of smaller size simultaneously (as illustrated)

- √ 100% automatic clamping of beams
- ✔ All movements automatically interlocked and push button controlled for efficiency and high output

Here again is an example of a Birdsboro development that means higher production of a finer product at lower cost. Therein lie future profits.

Your own mill profit picture will look much brighter after you've seen the many innovations Birdsboro can now offer you. Contact your nearest representative or call Birdsboro Steel Foundry & Machine Co. Main Office, Engineering Department and Plant: Birdsboro, Pa., District Office: Pittsburgh, Pa.

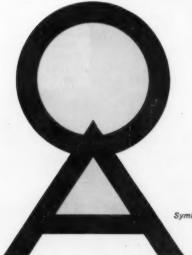
MM 58~5

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • MYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel





Product that's exactly what you want . . . inspected to your individual standards . . . packed and shipped in the bulks and sizes you can best handle. This kind of personalized Olin Aluminum service, and constant watchfulness, can save you time and trouble—and that means money.

To achieve this, we cram our Customer Requirement Record with more detailed facts about your operations, needs, likes and dislikes than anyone else, we believe. But that's where we see our biggest future: in offering you personalized individual service that fits you like a glove.

If you'd like this kind of special attention and service, call the nearest of our 29 offices or write: Aluminum Division, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, N. Y.

Symbol of New Standards of Quality and Service in the Aluminum Industry



& AND "OLIN ALUMINUM" ARE TRADE

Shutdowns
for lubrication
cut in half
with

RYKON

Grease

Dollars in production time saved by using RYKON in high temperature service at Northwestern Steel & Wire Company

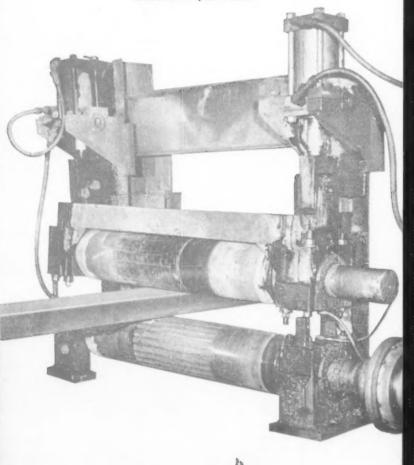
Bearings on the 46-inch blooming mill manipulator and side guard carrier had to be lubricated twice each eight-hour shift before Rykon Grease was used. The mill had to be shut down while the lubrication work was performed. Now with Rykon, the bearings are greased once each shift. Maintenance men find rollers and pins are still well lubricated. The rollers are subject to almost constant heat and water washing. Steel blooms heated to approximately 2300° F. are just 18 inches away from the Rykon lubricated bearings. The lubricating properties of the grease are unaffected by the heat.

RYKON Grease delivers similar performance results elsewhere in the plant. In roller bearings on the reheating furnace charging tables, in pinch roll bearings and in other trouble spots, where heat and continuous water washing would make short work of other greases, RYKON stands up to the test.

A unique nonsoap, organic thickening agent gives RYKON Grease the ability to provide lubrication in tough-to-lubricate spots long after other greases have failed. This thickener is the result of five years of research effort by a Standard Oil grease research team working to develop an outstanding industrial grease. RYKON Grease is a true multipurpose grease capable of performing all lubrication jobs on one piece of equipment or often in an entire plant.

More facts about RYKON Grease are available from the Standard Oil lubrication specialist that is near you in any of the 15 Midwest and Rocky Mountain states. Call him. Or write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

Bloom in the pinch roll. A 2300° F. bloom goes through while water washes continuously. RYKON Grease keeps this equipment lubricated at all times in spite of heat.



Quick facts about RYKON Grease

- Stable at high temperatures.
 At sustained high temperatures RYKON Grease remains soft and grease-like.
- . Resistant to water washing.
- Mechanically stable. Minimum change in consistency in service.
- Resistant to oxidation.
 Thickener acts as an inhibitor.
- Exceptional rust preventive properties.

You expect more from STANDARD



and get it!

Lubrication time cut. Mill feeder pinch roll bearings formerly lubricated twice each eight hours. Now with RYKON Grease lubrication is needed only once each shift. Elbert Dean, Northwestern Steel lubrication engineer, and Standard Oil lubrication specialist, Charles Daub, inspect bearings. Counseling people who have lubrication jobs like this is work for which Chuck Daub is well-qualified. Chuck has 12 years' experience in lubrication technical service work. He has an engineering degree from Illinois Institute of Technology and has completed the fifteen week Standard Oil Sales Engineering School course.



PROFITS ARE BEING SOUEEZED BETWEEN RISING MANUFACTURING COSTS AND THE NEED FOR COMPETITIVE PRICING!

The front office <u>does</u> know how critical your specification of equipment is . . .

Obviously, you and the other men in your plant, who devise production processes and select equipment, literally control the company's ability to make its product competitively.

That competitive ability earns the profit the company must have to stay in business.

Thus, you and the others, who specify equipment purchases, deal as directly with your company's profit as do the Board of Directors and entire executive staff.

Sciaky knows your important relation to the company's profits, too. That's why Sciaky resistance welding and production equipment is built to satisfy the requirements of your particular application. That's why Sciaky equipment is tested and proved to do your particular job before shipment.

As a result, it's easier for you to do a better job. You get the right equipment at the right price . . . you need only a mini-

mum of time and cost for production tryout . . . you don't suffer from excessive rejects or re-work operations.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

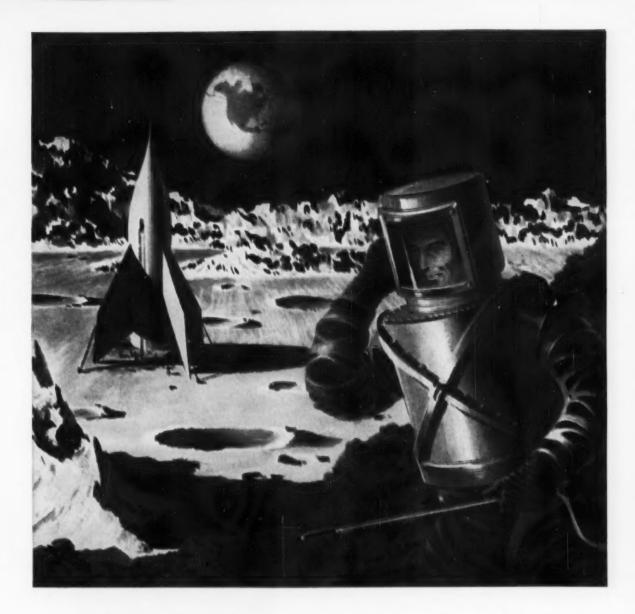
A major manufacturer of air conditioning units took that advantage. As a result his production requirements were satisfied with a relatively low cost, versatile assembly line of standard welders adapted with simple tooling. The excessive cost of a complex, fully automatic machine (which was originally thought necessary) was avoided. Write for "Resistance Welding At Work," Vol. 4, No. 10 for details of this ingenious solution.



641

SCIAKY BROS., INC., 4923 W. 67th STREET, CHICAGO 38, ILLINOIS . POrtamouth 7-5600

THE IRON AGE, June 26, 1958



Even out there, a friendly voice

How lonely he'll be—that first man to touch the silent, ominous surface of the moon! What shred of hope would he have, were it not for that reassuring contact with home right there in his hand?

There is now no doubt that radio contact can be maintained between the Earth and our moon pioneers. The friendly voice from home will come through clear and comforting, thanks partly to improvements in electrical insulations being made today by CDF.

FOR SPECIFIC INFORMATION on any CDF insulating material, see Sweet's, Electronics Buyers Guide, and other directories. Then send us your print or

your problem, and we'll recommend the proper material for your application.

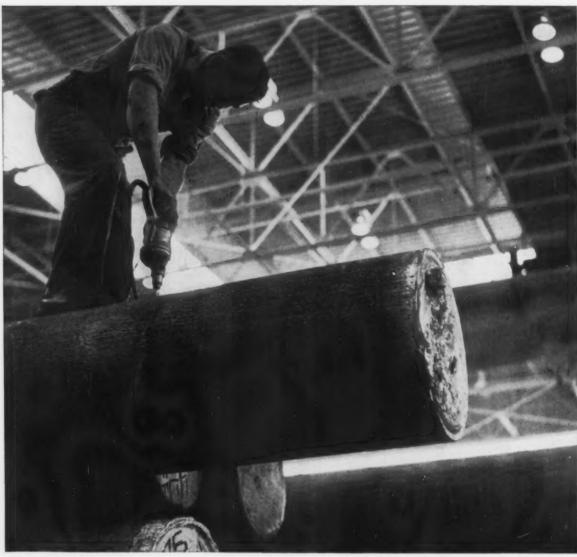
coff Makes Dilecto Laminated Plastics • Di-Clad* laminates for printed circuits • Celoron and Polyester-Glass Molded Plastics • Micabond Mica Products • Diamond Vulcanized Fibre and Vulcoid • Flexible Tapes of Teflon†, Silicone, and Micabond. Complete Fabrication Facilities.

*Trademark of Continental-Diamond Fibre tduPont trademark for its TFE-fluorocarbon resin.



CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE Best COMPANY . NEWARK 85, DEL.



Kaiser Aluminum ingots being prepared for "homogenizing" in Gas-fired furnaces prior to extrusion into aircraft parts

GAS assures

precision alloy extrusions at Kaiser Aluminum

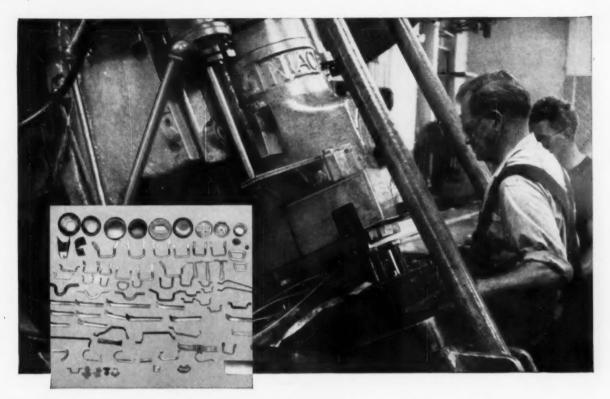
Gas plays a major role in the development of precision quality alloy extrusions for aircraft at the U. S. Air Force Heavy Press Plant operated by Kaiser Aluminum at Halethorpe, Maryland.

With Gas, uniform temperature and controlled atmosphere keep molten aluminum flowing smoothly into casting equipment. The metal is cast into logs about 12 to 26 inches thick and 25 feet long. Gas-fired furnaces heat the logs to 1000° F and hold this temperature about 24 hours to homogenize the metal prior to extrusion. The long logs are cut into 58 inch billets,

placed on the press and extruded into various shapes.

Again, Gas is used to heat the extruded shapes in a controlled atmosphere to impart the desired physical qualities in the alloys used. As in the melting process, Gas provides precise temperature control and close control of atmosphere within the furnace.

For information on how Gas can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and outstanding results Gas and modern Gas equipment provide. American Gas Association.



"We stamp them all using just 2 Cities Service Oils!"



Presses shift to numerous operations without ever changing oil, thanks to versatility of the 2 Cities Service oils used for all jobs.



Handles by the thousands are produced by Res for cooking utensils and similar items. Finish is excellent, thanks to Cities Service oil.

...says Res Manufacturing Company Milwaukee, Wisconsin

It's doubtful if anyone makes a more diversified line of stamped and formed metal products than Res Manufacturing Company.

With its 21 presses, ranging from 15 to 200 tons capacity, Res turns out millions of articles a year . . . wire handles, metal handles, wire forms, drawn shells, lifting loops, and parts for electrical controls, to mention just a few.

"All require the best possible finish and all get it with the use of just two Cities Service oils," says Assistant Plant Manager Herbert W. Krueger.

"For drawing, shaping, and punching aluminum, we use Cities Service Chillo #2 with excellent results. Where drawing, swedging or forming of steel and brass is required, we use Cities Service Chillo 12 and get equally fine results.

"Not only do these two Cities Service oils handle all our jobs and produce the best possible finish, but we also find they increase tool life and hold scrap to a minimum. In short, these are the best oils we have ever seen."

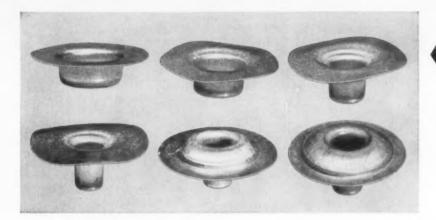
Like Res Manufacturing, chances are your operation can be simplified with the right Cities Service oils. Talk with a · Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N.Y.

CITIES (SERVICE

QUALITY PETROLEUM PRODUCTS

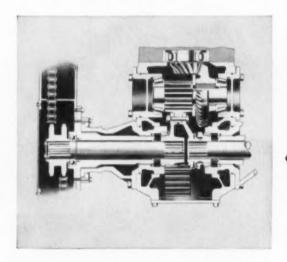


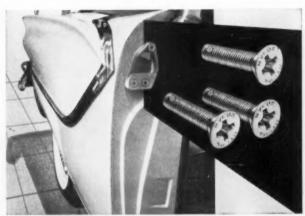
at your plant.



HERE ARE SIX STEPS of possibly the severest manufacturing torture that a galvanized steel sheet can take. In its final form, it becomes the end piece of a muffler manufactured by the Mackenzie Muffler Company, Inc., Youngstown, Ohio. It is made out of Republic Continuous Galvanized Sheets. Despite the many deep drawing operations, the coating does not crack, flake, or peel. Republic Galvanized Sheets can do a profitable job for you. Clip the coupon and mail it in for more information.

SAFETY COMES FIRST -- in the door latching of Ford cars. So Ford engineers have specified Republic Nylok Bolts to anchor the striker plate to the door post. Nylon pellet insert in bolt body forces a tight metal-to-metal lock between mating threads for a positive, vibrationproof clamping action. Republic Nylok Bolts are adjustable and reusable with no loss of holding power. Send coupon for descriptive folder.





EXCEPTIONALLY HIGH STRENGTH-TO-WEIGHT RATIOS plus resistance to fatigue, stress, shock, and impact are values of Republic Alloy Steels that equipment builders have been relying on for years. Engineers and metallurgists of the Adams Division, LeTourneau-Westinghouse Company, for example, spent thousands of hours on research and testing of all types of steels to find one that would reduce ultimate fatigue to an absolute minimum in the drive axle of their "660" Motor Grader. They selected Republic Hot Rolled 4340 Alloy Steel. This fine steel not only resists fatigue, but also is able to take high torque without a permanent set. Specify Republic Alloy Steels where strength and toughness must resist heavyduty roughness. Our metallurgists will help you.

REPUBLI STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION DEPT. IA-5509							
1441 REPUBLIC	BUILDING .	CLEVELAND	1, OHIO				
D H Win.	Marellonales	11					

☐ Have a Wire Metallurgist call. Send more information on:

□ Wire ☐ Continuous Galvanized Sheets

Nylok Bolts and Nuts

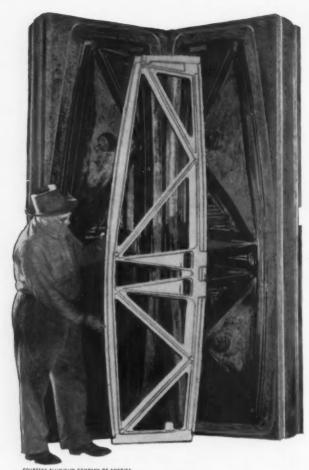
☐ Alloy Steels

Name_

Company.

Address City_

Zone State



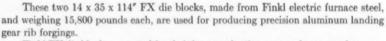
DE BLOCKS . FORGING

STARIS . ELECTRIC FUT

Increase Production

with FINKL DIE BLOCKS

...the aircraft industry does!



Finkl FX die blocks are noted for their long production runs and economy because:

- FX covers the full usable hardness range from Temper H (477-444 BHN) to Temper 4 (293-269 BHN).
- FX produces the greatest number of forgings per impression because its well balanced alloy content offers uniform hardness and freedom from temper brittleness.
 Relatively high tempering temperature promotes ductility and elimination of residual stresses.
- FX Special Machining Quality appreciably reduces shanking and sinking time.
 These proved advantages can also mean savings to you with more pieces per die and better deliveries to your customers.

Save money by talking to a Finkl representative the next time you are considering die blocks or forgings.

A. Finkl & Sons Co.

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Offices in: DETROIT · CLEVELAND · PITTSBURGH · INDIANAPOLIS · HOUSTON · ALLENTOWN · ST. PAUL COLORADO SPRINGS · SAN FRANCISCO · SEATTLE · BIRMINGHAM · KANSAS CITY

Warehouses in: CHICAGO · DETROIT · BOSTON · LOS ANGELES

YEARS OF PROFITABLE PRODUCTION

BUILT INTO

"BUFFALO"

NO. 18 DRILLING MACHINES

These drills are constructed to provide the longest possible useful life and the utmost accuracy in operation. Easy to set up and operate, the rugged, dependable No. 18 is designed to cut production costs in a wide variety of operations.

Quality Features of the "Buffalo" No. 18 Drill:

- SPINDLE Multiple-splined alloy steel, ground, polished and carefully balanced. Rotates in two precision-type ball bearings, designed to take the thrust of heavy-duty operations. Design of spindle pulley bearings prevents torque being transmitted directly to spindle.
- FRAME Large, heavy head frame insures accuracy throughout life of machine.
- TABLES AND BASES Built to extra-heavy proportions, with large working surfaces.
- **RAISING SCREW** Full ball bearing construction, actuated by machine-cut steel screw and gears. Three ball thrust bearings provide easy operation.
- FOOT FEED Operated by a gear meshing the feed pinion. Foot treadle return by torsion spring, giving maximum return pressure at end of stroke.

For capacities up to 1" in cast iron, the "Buffalo" No. 18 Drill is your best buy. Available in floor and bench models — bench types up to 6 spindles.

Contact your "Buffalo" machine tool dealer for full information on the No. 18 Drill, or write us direct for Bulletin 3123-E.



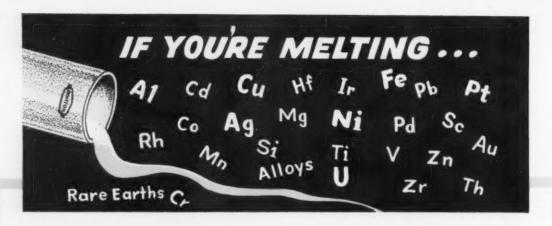
B WELFFI

BUFFALO FORGE COMPANY

492 BROADWAY • BUFFALO, N.Y. Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING





Norton crucibles, available in many materials, meet a wide range of needs

HEAVY WALL CRUCIBLES

Furnace Sizes in Pounds ½ to 300

Outside Diameters 11/4" to 121/4"

Wall Thicknesses 1/8" to 5/8"

Over-All Heights 31/2" to 161/2"

Materials Available

THORIA

URANIA

THORIA

ALUNDUM* "A" 99% Alumina CRYSTOLON* "G" First Quality Silicon Carbide

"N" Nitride Bonded

Silicon Carbide MAGNORITE* "K" 97% Fused Magnesia All Sizes Shown

All Sizes Shown All Sizes Shown

All Sizes Shown

"H" Fused Stabilized ZIRCONIA

Zirconia

All Sizes Shown

1/2 to 50 lbs. 1/2 to 50 lbs.

LIGHT WALL CRUCIBLES

Furnace Sizes in Pounds ½ to 50

Outside Diameters 1 %" to 5 1%"

Wall Thicknesses 3/2" to 3/2"

Over-All Heights 31/2" to 1011/4"

Materials Available

ALUNDUM "A" 99% Alumina

MAGNORITE "M" 99% Fused Magnesia

1/2 to 50 lbs. 1/2 to 50 lbs.

ZIRCONIA "H" Fused Stabilized

Zirconia

1/2 to 50 lbs. 1/2 to 17 lbs.

Norton crucibles are engineered and prescribed for a long list of metal melting operations. Available in a wide range of materials, sizes and types - as shown in the tables they provide long, trouble-free service, protect your product purity and meet specific melting requirements.

Norton heavy wall crucibles, exceptionally strong and dense, are used for most induction furnace melting jobs. Thin wall crucibles, gener-

ally of lower porosity, are particularly suited for special and nuclear metallurgical processes. Their fine, smooth surface is particularly valuable for protecting high purity metals from refractory inclusions.

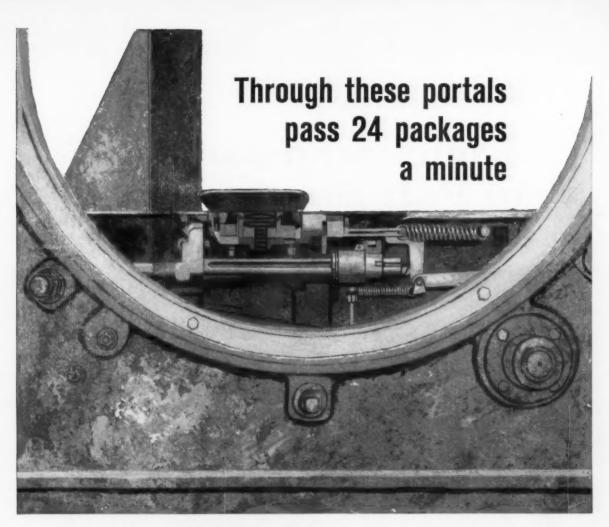
It will pay you to get further facts on this complete line of crucibles. For exact recommendations and all necessary details, contact your Norton Representative. Or write for new catalog, "Norton Refractory Crucibles,"

to Norton Company, 205 New Bond Street, Worcester 6, Mass.

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries



Making better products . . . to make your products better NORTON PRODUCTS Abrasives . Grinding Whoels . Grinding Machines . Retractories . Electrachemicals ... BEHR-MANHING DIVISION Coated Abrasives . Starpening Stones . Pressure-Sensitive Tapes





This is the "business end" of the USS Gerrard Model 12—the low-cost automatic strapping machine that makes up to 24 cycles a minute. The Model 12 comes in two sizes that handle packages as small as 8" wide by 2" high; the larger Model 1250 handles packages up to 26" wide by 20" high. Both machines are equipped with a compression device that compresses the packages and holds them in position during the tying operation.

The Model 12 is 31" high, weighs only 1350 pounds, and requires only 7½ square feet of valuable floor space. Using extrastrong USS Gerrard High-Tensile Round

Steel Strapping, 14 through 18½ gauge, you can thread the machine in less than a minute. It's simple to operate, and its compact, rugged construction with a one-shot built-in lubrication system means low maintenance. Tension can be predetermined, and when set is uniformly maintained on all packages regardless of size or weight. Packages which vary in size and shape can be strapped without adjustment to the machine.

For more information, contact your USS Gerrard sales representative. Also be sure to mail the coupon for the folder on the Model 12. USS and Gerrard are trademarks



Gerrard Steel Strapping Dept.
U. S. Steel Supply
Division of
United States Steel

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T. R. DREYER, Vice President—Brooklyn Manufacturing
American Machine & Foundry Company

a man who came to Fair Street



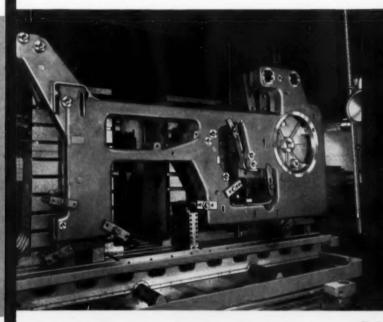
"The JIGMIL Technique enabled us to establish new manufacturing methods which provided greater accuracy, improvement in our product, substantial reductions in assembly time, and major reductions in machine time, all without investment in jigs."

"We accepted an invitation to go to Fair Street and there saw the JIGMIL Technique in operation doing boring and milling to high degrees of accuracy and economy. The potential savings in our own plant became apparent and we developed a JIGMIL program which resulted in new economies in our manufacturing methods. The inherent accuracy, power and rigidity of this machine tool, combined with its automatic positioning and ease of operation are especially adaptable to precision boring and milling operations on side frames and gear boxes. In addition to the noteworthy savings in boring time and reduced tooling cost, we gained the advantage of milling in the same setting at a minimum of cost."

T. R. DREYER

SOME OF OUR JIGMIL USERS

Aerojet-General Corp.
American Can Co.
American Can Co.
Aveo Manufacturing Corp.
Baldwin-Lima-Hamilton Corp.
Beech Aircraft Corp.
Boeing Airplane Co.
Boyar-Schultz Corp.
Carrier Corp.
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Douglas Aircraft Co., Inc.
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The Falk Corp.
Foote-Burt Co.
Goss Printing Press Co.
Grumann Aircraft Engineering Corp.
Hamilton Ltd., Division, United Aircraft Corp.
Hardinge Bros., Inc.
The Hell Co.
Illinois Tool Works
Ingersoll-Rand Co.



A FEW PROVEN ADVANTAGES OF THE JIGMIL TECHNIQUE—

- Eliminates cost of expensive jigs and production delays resulting from their manufacture.
- · Simplifies tooling.
- Employs automatic functions to reduce factors of human error even in close tolerance work.
- . Makes possible greater flexibility of product design.
- Improves end product by permitting interchangeable assembly of parts without hand fitting.
- · Increases production and product accuracy.

ACCURACY IS AN ECONOMY!

A TYPICAL EXAMPLE OF JIGMIL VERSATILITY

AMF uses the JIGMIL Technique for machining a multitude of components for their cigarette making machines, bread-wrapping machines, automatic pin setters, cigar making machines and many others. Illustrated is a pair of bread-wrapper side frames set against angle blocks on a Model 4B-96 SPIRAMATIC JIGMIL. All boring and side milling operations were done on the JIGMIL in one setup. Previous time on conventional boring and milling machines was 10 hours per part. Time on the JIGMIL is 3 hours per part.

The Glenn L. Martin Co.
Michigan Tool Co.
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North American Aviation, Inc.
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WILL YOU BE THE NEXT TO VISIT FAIR STREET

Model 48-96 SPIRAMATIC JIGMIL as used by American Machine & Foundry Co.
For complete information on DeVilog Spiramatic



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SPIRAMATIC JIGMILS®

ACCURATE HOLES AND FLAT SURFACES IN PRECISE LOCATIONS

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BRASS is the background for more success stories than you can count — in manufacturing and merchandising, both. In everything from precision parts to eye-catching personal accessories, good solid Brass is the base of success . . . for its workability, its customer acceptance as a guarantee of quality . . . and, especially today . . . its attractive price.

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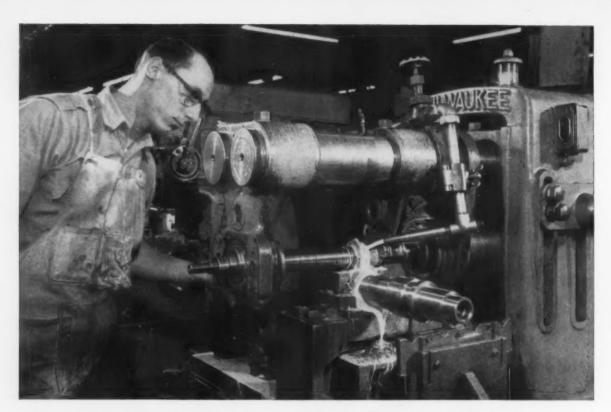
Continuous broad strip finshing mill at August Thyssen-Hütte

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NEW GULFCUT HEAVY DUTY SOLUBLE OIL

IMPROVES MACHINING PRACTICE 4 WAYS

On jobs that call for an emulsifying cutting oil, you'll get the best possible results with Gulfcut Heavy Duty Soluble Oil. Here's what it can help you do:

1. MAKE YOUR TOOLS LAST LONGER! With Gulfcut Heavy Duty Soluble Oil you get more effective cooling because of its higher surface-wetting qualities . . . better lubrication because of its excellent extreme pressure characteristics. Both of these properties help prolong tool life, even on alloys of low machinability.

2. TAKE HEAVIER CUTS AT HIGHER SPEEDS. This heavy duty oil forms a thin, tough anti-weld film between the tool and the work and between the tool and the chip... permits heavier cuts to speed up production.

3. GET FINER FINISHES. Case histories in Gulf's files prove that Gulfcut Heavy Duty Soluble Oil

has been used to produce a 6-micron finish . . . comparable to that of plate glass.

4. PROTECT PRODUCT, EQUIPMENT AND PER-SONNEL. This oil contains a special rust inhibitor to protect tools, machine and work piece against rust and corrosion. It also contains an effective germicide to help eliminate rancidity and odor.

Get the full efficiency-economy story on new Gulfcut Heavy Duty Soluble Oil now. Call your Gulf Sales Engineer, at your nearest Gulf office, or write for bulletin.

GULF OIL CORPORATION

Dept. DM, Gulf Building Pittsburgh 30, Pa.





The steel bar that has high strength WITHOUT HEAT TREATING

Yes, La Salle invites you to test a sample bar of the remarkable new FATIGUE-PROOF. This amazing new material is its own best recommendation . . . as proven by the many original equipment manufacturers who have already tested (and are using) FATIGUE-PROOF.

If you are making parts requiring strengths in the tensile range of 140,000 to 150,000 psi, and want to eliminate the expense or problems of heat treating . . . if you want to save production costs with a bar that machines faster (25% faster than annealed alloys—50% to 100% faster than heat treated alloys) and gives you a beautiful finish, too . . . if you want to improve the quality of your product while saving money, send us a blueprint, drop us a note giving application details, or better yet . . . pick up your telephone and call a La Salle sales engineer (REgent 4-7800, Chicago, Illinois).

steel

FREE

Get your copy of "a new material," a 24-page booklet which gives detailed information on La Salle "FATIGUE-PROOF" steel bars.





Line of Quality Cold-Finished Steel Bars

Please send me your "FATIGUE-PROOF" Bulletin.

Name

Title

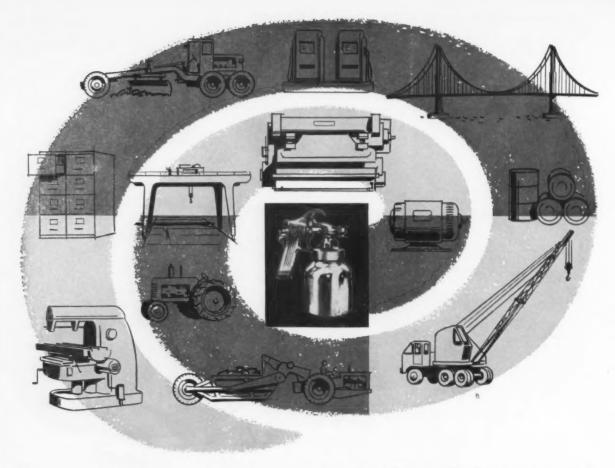
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Great advance in "air-dry" paint quality at no cost premium

with new Isophthalic based resins

With Oronite's superior new raw material, Isophthalic, years of extra service can be added to your metal surface coatings. Stronger film to metal bonding, outstanding film flexibility and better gloss retention of Isophthalic based coatings means improved paint performance. The tougher Isophthalic based films also have greater abrasion resistance, hold up far better under severe weather exposure, are more resistant to chemical and industrial fumes.

DEMONSTRATION—FORMULATIONS—PROOF. Let Oronite or your resins supplier show you how Isophthalic based resins can benefit the coatings you use. Oronite field representatives can demonstrate to you the superior properties of Isophthalic resin coatings—whatever your product requirements. Just contact the Oronite office nearest you.



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Tulsa, Los Angeles, San Francisco, Seattle

Foreign Affiliate: California Chemical International, Inc., San Francisco, Geneva, Panama

489

How to make good use of bad times

Remember how management not long ago kept pressuring for "more production." There was no time then for analyzing productive efficiency. So a mild recession isn't all bad . . . if it gives you badly needed time—time to spot areas where you can cut operating costs.

For instance: It's highly probable that there are several areas where you could save by substituting one of our special-purpose refractory materials. Especially in "vulnerable" areas exposed to flames, abrasion, corrosion, high heat or heavy loads. Or, in "working" areas where the heat must pass through the refractory evenly and rapidly.

For example: One of our customers replaced his fireclay hearth with our CARBOFRAX® silicon carbide refractory and in one year eliminated 30 days downtime . . . In the walls of a retort, the high thermal conductivity of this same material made possible a new vertical redistillation process for the production of special high-grade zinc . . . In the floor of another furnace, CARBOFRAX refractories outlasted alloy parts 6 to 1. The examples are countless—as are the variety of materials applied.

Granted, Carborundum's refractories cost more. But they also save much more—in terms of refractory life... furnace downtime... and maintenance costs. They also do more—in terms of higher furnace output... faster heat transfer... and increased efficiency. In short, we wouldn't be in business if you couldn't cut costs with super refractories.



Here's how you can start cutting costs: It will take less than an hour to read these two booklets about the applications—and properties—of Carborundum's unique, new super refractories. Send for them today.

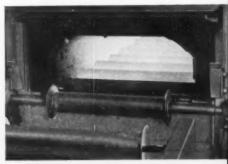


Subscription to "Refractories" is yours for the asking. This technical brochure is published approximately every other month; contains a wealth of information on new refractory materials, lining techniques, etc. Offer limited.

Refractories Division, The Carborundum Company, Perth Amboy, New Jersey, Dept. B68B.

CARBORUNDUM

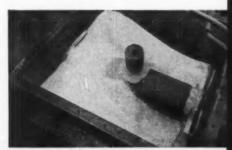
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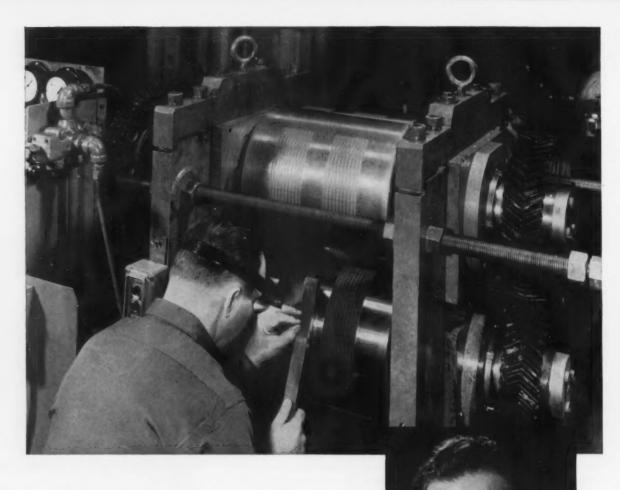
. HEAT? Instead of using metal rollers, the manufacturer of this annealing furnace substituted a roller hearth made of one of Carborundum's special refractories. As a result, the hearth now stays straighter, lasts longer, and reduces marking and pick-up.



ABRASION? The skid rails supporting these billets were formerly alloy. They required complete replacement (plus constant maintenance) every 2–5 weeks. When replaced with Carborundum's silicon carbide refractory, they lasted 3 years—required no attention.



ATMOSPHERES? This furnace is heated to 3000°F by moly wire wrapped around the muffle. The muffle is made of our fused aluminum oxide—and insulated with our granular alumina "bubbles." These refractories have proved stable and durable—are not even affected by hydrogen or cracked-ammonia atmospheres.



"Quality perfection is our business —Standard Steel helps us maintain it—and more"

Alclyde Engraving is in a fascinating business. Chances are the dashboard trim, instrument panels, and scuff plates on your car were embossed on Alclyde rolls—this firm manufactures the major part of all rotary register embossing rolls used by the automotive industry.

The packaging, labeling and plastics industries are also heavy users of Standard-forged, Alclyde-engraved rolls. And in all fields in which design changes are a frequent and vital competitive factor, Alclyde must deliver perfection in a hurry.

That's why we at Standard have geared ourselves to give Alclyde the quality perfection and service it requires. In fact, it's the service we can give that all of our customers particularly appreciate. Won't you discuss your quality and service requirements with us? Write Dept. 1-F.

"Yes, Standard Steel Works, in supplying us with matched, flame-hardened forged steel embossing rolls, meets our rigid specifications for steel analysis and accurate machining. Nothing is more vital to an engraver than to have perfection all along the line-But in addition, we appreciate the warm, personal relationship which exists between us. The people at Standard appear to be really interested in our business and problems," says Frank W. Broderick, president Alclyde Engraving Co., Chatham, N. J.

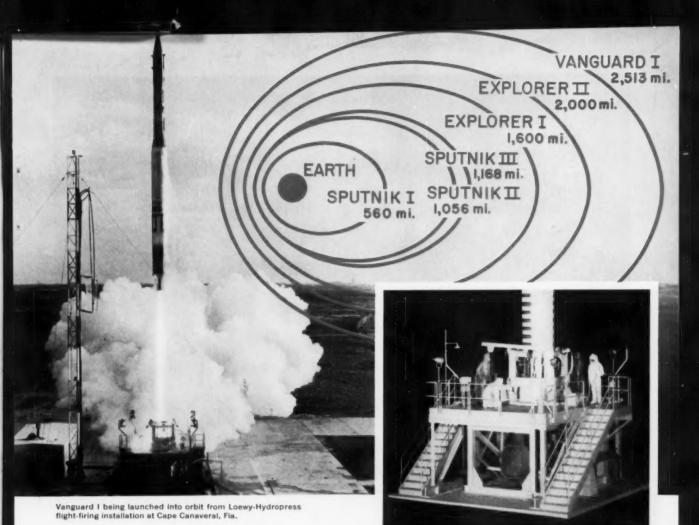
Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes





Scale model of Loewy launching platform and rocket stand.

Loewy launching installation helps boost American moon to highest altitude of all satellites

On March 17, the Navy's Vanguard rocket, built by The Martin Company, soared from its Loewy-Hydropress launching installation into the blue and into orbit at the greatest altitude of all satellites—2500 miles from the earth at apogee.

When Vanguard misfired, on December 6, 1957, in this country's first attempt to put up a satellite, the conflagration could have completely destroyed the launching facilities. But Loewy had designed and built them so well that damage was extremely limited. The fire-fighting system released a torrent of water fog to combat the intense heat of the burning rocket fuels. Within an hour of the mishap, Loewy engineers were assessing the damage and lining up repair crews. Within a week, the static and flight-firing facility was repaired, and Vanguard's second stage was erect and under test. One more week and the first stage stand and weight recording system

were completely repaired and operational.

The launching pad is 15 x 20 ft. in area, On it is erected a 6-ft. cubical test and flight-firing stand. Equipped with mechanical, hydraulic and electronic instrumentation, a unique flame-deflecting system and fail-safe devices, this installation has the function of static testing and flight firing. It also weighs the rocket and its fuel and measures the thrust of the first and second stage engines.

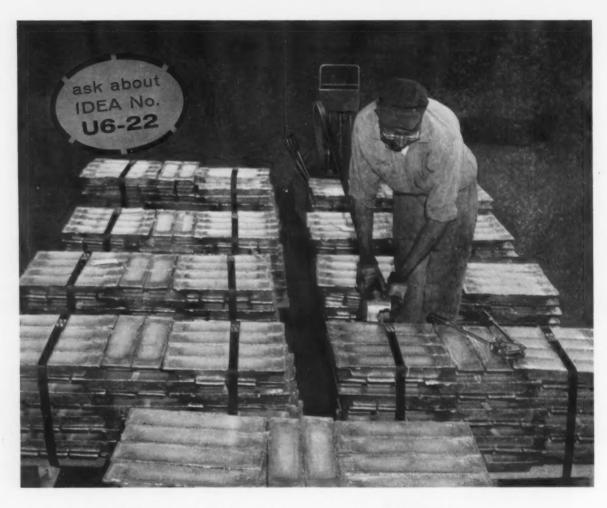
Because of its experience in missile launching and handling systems, Loewy-Hydropress is the coordinating agency for the combined rocketry facilities of all Baldwin-Lima-Hamilton divisions. Consult us about any problems that may confront you in research, development, design, construction or manufacturing for the structural, hydraulic, electronic and thrust measurement elements. Write to Dept. A-6.

Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

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Work with your AIM*...Federated Metals does...

Steel strapping cuts ingot loading time in half

Acme Idea Man
Andy Bassi assists
Federated Metals
and many other
companies with their
packaging and
materials handling
problems.



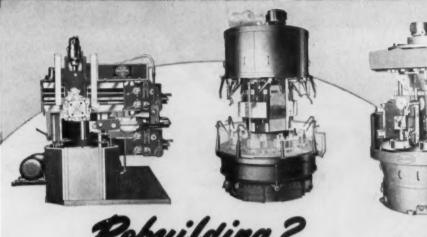
FEDERATED METALS Division of American Smelting and Refining Company, Whiting, Ind., was looking for ways to speed handling and unloading of non-ferrous alloys. Their Acme Idea Man suggested a method using heavy-duty Acme Steel Strapping (Idea No. U6-22).

Now ingots are strapped to skids and these units are loaded into box cars and trucks with lift trucks. Formerly, the ingots were loaded loose on skids brought to the cars and stacked by hand. The new method cuts loading time by 50%, and customers report unloading costs are reduced by as much as 75%!

Unitizing ingots enables Federated Metals to double and triple storage capacity, too, because the units can be stacked for maximum utility of warehouse space.

*Work with your Acme Idea Man to improve your materials handling from a time and money-saving standpoint, as well as for increased product protection. Write Dept. IFU-68, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.





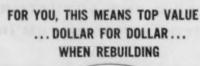
Robuilding?

Yes Sir, We're Interested!

A Machine Rebuilding Program has been established which permits us to offer you excellent service on rebuilding your present Bullard equipment.

We believe that our facilities offer you many advantages including:

- 1 "Original manufacturers" know-how.
- 2 Genuine replacement parts.
- 3 Full year's guarantee on all parts replaced including labor costs.
 - 4 All work done by factory-trained assembly personnel.





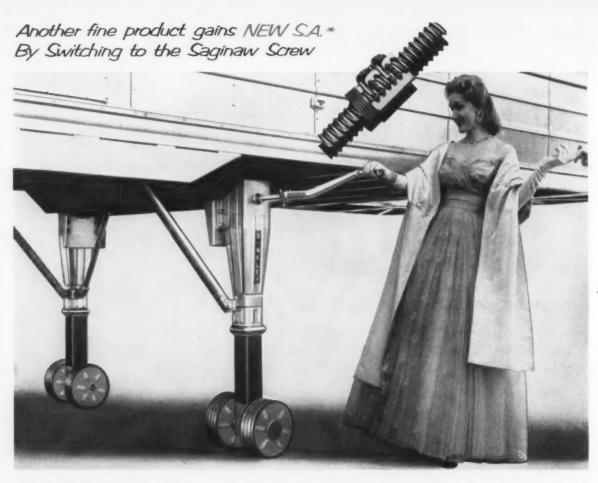
MACHINE TOOLS THE BULLARD COMPANY BRIDGEPORT 9, CONNECTICUT



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Horizontal Boring Machine	Spacer Table
Mult-Au-Matic	Contin-U-Matic
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WORLD'S MOST EFFICIENT ACTUATOR OPERATES TRAILER LANDING GEAR WITH 5 TURNS PER INCH INSTEAD OF 20

It's "happy landings" for truckers from now on—since Binkley Manufacturing Company has developed and marketed a new truck trailer landing gear which can be raised with 75% less cranking. They gave their product this new *Sales Appeal by switching from a high-friction acme screw to the almost frictionless Saginaw Screw.

The truly amazing ability of the Saginaw Screw to convert rotary motion to linear motion with over 90% efficiency is saving power, space, weight and assuring smoother, more dependable performance in countless products from miniature electronic controls to giant production equipment.

Perhaps the Saginaw Screw can give your products that vital new Sales Appeal you're looking for right now. To find out, write, wire or telephone Saginaw ball/bearing Screw Operation, Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan—world's largest producers of b/b screws and splines.



Compete with Wire Imports

It can be done. Despite reports that the Southwest has taken a heavy drubbing on imported wire products, one producer in the area has exceeded last year's sales levels for nails every month since February. At the moment the plant is operating at capacity with a backlog of orders.

Extruded Bearing Races

New technique will cold form inner and outer races of bearings from one piece. A cup with two diameters is backward extruded. The inner and outer race sections are then cut apart. Big advantage is savings in material and machining steps.

Vacuum Degassing Units

At least three new vacuum degassing installations are due to come into action in the near future. Following a steel industry lead, two or more major forge shops with electric furnace capacity are going to vacuum degassing of ingots and blooms. In at least one of these, vacuum degassing of steel castings is under strong consideration and a decision to go into the field could be announced within the next 60 days.

Coal for Gas-Turbine Units

A coal-fired gas-turbine unit of locomotive size has stood up to 3,760 hours of testing. The operation of the combustors and the fly-ash separator were such that combustion efficiency was consistently over 95 pct. The pulveriser, on which depends the efficiency of the turbine and the life of the blades, behaved very well.

Urge Overseas Investments

U. S. manufacturers who sell overseas are being urged to set up plants in proposed common market or free trade areas before it's too late. In a few years American firms could find themselves excluded by impenetrable tariff walls, Bureau of Foreign Commerce officials say. Careful planning and building now, they add, would put firms safely within the walls and avoid need for costly moves after common market plans become working realities.

Use Gas for Lubrication?

Gas or air lubricated bearings show increasing promise for space-age. Already they're used in computers and precision gyros and would be ideal for long uninterrupted operation such as in space travel. In gas lubrication, high-pressure neon, helium or air is injected around a bearing.

Progress in Steel Outlook

A new optimism is coming into the steel picture. Two mills that had been considering July shutdowns are going to keep operating. A number of warehouses are reported laying in steel in anticipation of a strong upturn. A pickup in mill orders for July is leading producers to revise upward their estimates for the month. Mills still expect a dip, but not the sharp plunge that was indicated two weeks ago.

Pipelines Being Considered

Government is expected to turn down bids for defense loan guarantees for two new petroleum pipelines. They may be built anyway. Both would start in Texas. One would run 1,425 miles of 22- and 24-in. pipe through Pittsburgh to Newark at a cost of \$195 million. The other would run 1,030 miles of 24- and 26-in. pipe to California at a cost of \$145 million.

Plastic Dampens Vibration

A new plastic material snaps back to its original size after being stretched to five or six times its original length. When used in handles for air-hammers, it is sufficiently rigid, yet at the same time vibration transmitted is drastically reduced. When used for solid tires for industrial trucks, power consumption is reduced as much as 50 pct when carrying heavy loads.



8 coordinated Clevelands power National Tube's

unusual tempering turnace

Gear speed reducers work in harmony to transmit power on National Tube's tempering furnace at McKeesport, Pa. Vital to their Warm Working Process, it heats pipe 900-1000° prior to entering the sizing mill.

Operating from a single power source these Cleveland right-angle drives handle the huge job of power transmission required to keep pipe production at high output rates.

That's a big reason why compact, rugged Cleveland Worm Gear drives are found in plants across the country where heavy duty drives of proven dependability are required.

Cleveland's new Bulletin 145 gives the latest specifications on the entire line of speed reducers. Write for your copy today.

The Cleveland Worm & Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.

Speed Reducers

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

Workers Turn Tables; Step Up Complaints Against Unions

Today's worker knows his rights. And that goes for labor as well as management.

Individual complaints against unions grow as workers oppose discriminatory union policies and actions.—By G. J. McManus.

 A sudden worker uprising is adding to the troubles of unions and may mean important changes in all labor relations.

In the first quarter of this year nearly 600 individual workers complained to National Labor Relations Board about unfair practices of unions. No Letup — That was 25 pct more than in the previous quarter. It was more than double the rate of a year ago and there are no signs of a letup. A growing number of workers are standing up in the open against unions.

"Rank and file employees are showing a determination to fight to the bitter end actions considered discriminatory even though the actions were taken by unions," says Jerome D. Fenton, general counsel for NLRB.

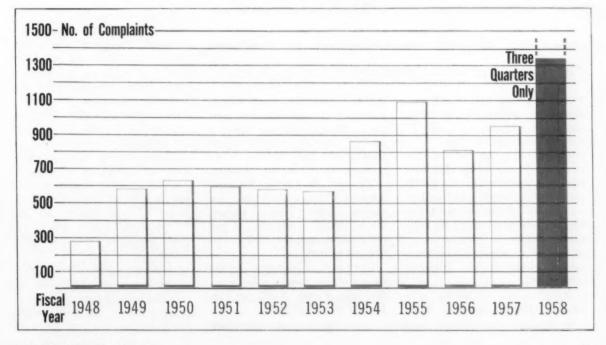
Knows His Rights—Other labor relations men agree. They say a new kind of worker is coming onto the labor scene. He is neither ignorant nor passive. He knows his rights. He has the individual aggressiveness to demand them.

At the moment, he is demanding the right to a clear, fair shot at available jobs. He says unions are interfering with this right. He is protesting and in some cases, making it stick.

For unions, the implications are clear and immediate. An increasing number of their members will not be content to follow meekly and blindly. For management, the change could mean a new need to consider workers one by one. Companies as well as unions are being charged

Workers Kick Back Against Union Tactics

Complains of Unfair Labor Practices Brought by Individuals Against Unions



with unfairness by individuals.

Underlying Factors — The new worker attitude began to show up last year. The economic lag was a factor, particularly in the big industrial unions. But in the general work force, it has not been just a case of new pressure on workers; it has also been an awakening to existing conditions, say labor experts.

Partly this has come because of a higher educational level among workers. Partly it has been a question of worker rights being more firmly established and widely known. Decisions by NLRB and the courts have spelled out the meaning of Taft-Hartley. The labor board has shaken off its old pro-union bias.

Abuses Disclosed — Final spark for the open rebellion of workers came from the McClellan committee. Disclosures of union abuses hit many workers who were already resentful. They may have turned anger into action.

"The strong searchlight focused by McClellan committee hearings caused individual workers to examine their relations with unions," says Mr. Fenton.

In any case, complaints against unions began rising last year. From July through September, 263 individual workers charged unions with unfair practices. In the October-December period, the number jumped to 472. In the first quarter of this year charges climbed to 596.

Job Discrimination — For the most part, workers are charging that unions are causing job discrimination. This can be a case of a man losing out because he is not a member of a union. It can be a union member who is bypassed because he is out of favor with the leadership.

The basic notion of Taft-Hartley is that a man can't be barred from working because he is a member of a union or because he is not a member. This principle has been modified to permit union shop agreements provided they allow non-members to join unions within 30 days.

Union Shop Restricted — Court decisions have restricted the union shop in several important ways. For job eligibility purposes, they have limited the qualifications for union membership to payment of initiation fees and dues. The Supreme Court has said workers may be "good, bad, or indifferent members without imperiling their livelihood."

Numerous complaints by individuals have turned on this principle. NLRB ruled against the International Union of Operating Engineers in cases involving discharges of five men who would not join the particular union branches stipulated by the union. The board held that the union was using job coercion for internal policing of its organization.

The board ruled that a Teamster local had acted illegally after an intra-union fight when it applied job pressure to men who had supported the losing side.

Can Oppose Union — International Longshoremen's and Warehousemen's union was denied the right to block employment of men who failed to join a strike by the union.

NLRB has ruled that unions cannot put job pressure on men who worked to promote rival unions. It has said that unions are guilty of coercion if they refuse to process grievances of non-members within the bargaining unit.

Another type of action involves discriminatory labor agreements. These include contracts or agreements that give unions sole and unlimited say in the hiring of employees. They take in arrangements that give unions full say on questions of seniority.

Hiring Agreements—This area is still blurred, but there has been a gradual narrowing of union power. In the past, NLRB had ruled that specific union hiring hall arrangements were accompanied by discrimination against workers. Within the last six months, a board decision has listed three general conditions for hiring agreements.

The agreement must definitely state that unions will not discriminate against non-members in making job referrals. It must leave employers the right to reject men sent by the union. It must provide for public posting of the first two safeguards.

In the big industrial unions most of the new complaints by individuals deal with the fairly narrow area of layoff priority. United Steelworkers of America has been the target

No Time for Management Complacency

The individual worker may have changed his attitude toward unions, but he is not showing any new fondness for management either.

In the first quarter of this year, more than 1100 individual workers complained to NLRB about unfair practices of employers. That's still almost double the complaints against unions by individual workers.

And the percentage of complaints against employers has increased since 1957.

These figures are slightly misleading. About 60 pct of the complaints against unions are accompanied by complaints against companies. In at least some cases, a practice that is basically unioninspired will show up also in the statistics as a company violation.

However, the big fact for management is that a third figure has entered the labor relations picture. It's no longer a question of just labor and management, but the individual as well.

Complaints of individuals involve 62 pct of first quarter unfair practice cases, a jump of 181 pct from the first quarter of 1957.

of a rash of complaints since the lag began. The union breaks down the charges into three groups.

Discharge Complaints—One class involves workers who were bumped from their jobs by foremen who dropped back into the bargaining unit when cutbacks came.

Another group comes under the heading of general dissatisfaction. A worker is laid off and appeals through the grievance system. He asks for outside arbitration and this is denied by the union. He then goes to NRLB with a complaint against the union and often the company. About 39 out of 40 of these are dismissed by the board, say the Steelworkers.

A third type of complaint is politically motivated, say Steelworker officials. The opposition group within the union brings charges against the union simply because it is automatically opposed to the official line.

Extent Surprising—Most of these complaints are the result of economic conditions in the steel industry. A certain amount of dissatisfaction is inevitable in a period of roll-backs. Complaints figure to fall off when the steel slump ends. However the extent to which steelworkers are blaming the union for their trouble is surprising. And the willingness of men to complain openly is significant.

Union men frankly admit there has been a change in their membership. They say the intelligence and initiative of the average member will work to the benefit of the organization. But they admit that many of the younger men do not have the solid union ties of veterans who went through bloody organizing periods.

Ninety Pct Dismissed—About 90 pct of the cases brought to NLRB are either dismissed or adjusted without formal hearings. The board seeks mainly to eliminate violations. If a man has been deprived of work unfairly, it will order him restored and direct the offending party to make good lost pay.

Until recently this left a question as to the liability of unions in cases

Behind Worker Complaints-

The Trend

In the nine months ending in March, more than 1300 individual workers complained to NLRB about union practices. This was more than 30 pct over the highest previous full year total.

The Spark

"The strong searchlight focused by the McClelland Committee hearings caused individual workers to examine their relations with unions," says Jerome D. Fenton, general counsel, NLRB.

The Gripe

Workers say they are losing jobs because of favoritism within unions and because of illegal union control of employment.

The Law

As interpreted by NLRB, the Taft-Hartley Act says workers can not be deprived of jobs because they are not good union members. A labor contract may require union membership, but workers can't be fired or denied work for failure to picket, honor picket lines, or pay referral fees. The law now bars contracts that give unions sole say in the hiring of workers or defining of seniority.

of unfair labor practice. Unions contended that NLRB had sole jurisdiction in such cases, which meant the worker could collect no damages.

Union Liability — Two recent Supreme Court decisions have overturned this thinking. One of these involved an Alabama worker who said he lost five weeks' wages because United Autoworker pickets kept him from entering a plant. A state court awarded \$10,000 in damages.

In the second case a California machinist charged that he was illegally expelled from a union; he said this led to loss of work as well as mental and physical suffering. The state court awarded him back pay plus damages.

Unions Worried — Both awards were upheld by the Supreme Court. In the opinion of two dissenting judges, the decision may force unions to curb their activities because it leaves them open to "staggering punitive damages."

Union officials say frankly they are scared to death of the situation. Prior to the court action, picketing violence could only draw a "cease and desist" order from NLRB. This was about the equivalent of a slap on the wrist, says one union man.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



INSIDE RUSSIA: George F. Sullivan, IRON AGE editor, with plant director B. N. Zherebin at training center for workers of Kuznetsk plant, Stalinsk, Siberia. Red technical training is intensive.

With U. S. Experts in Russia





■ In their 6500-mile tour of Russian steel and mining centers, U. S. steelmaking experts not only got a close look at Soviet equipment and techniques; they also got down to cases with Red industrial bosses.

George F. Sullivan, editor, The IRON AGE and a member of the American team, made this pictorial record of the tour, which included visits to plants, mines, and scientific institutes from Moscow and Leningrad to Siberia, the Urals, and the Crimea.

In the course of the month-long

A TOAST: Above, left, plant director Zherebin toasts E. L. Ryerson, head of U. S. delegation, at Kuznetsk works. Man in center is an openhearth foreman.

STREET SCENE: Russian school children surround J. B. Austin, U. S. Steel's research vice president, during group's visit to Chelyabinsk.





LENIN QUOTE: "The productivity of labor is the most important factor in winning the victory." So says sign above head of F. M. Rich, center, Inland Steel, top left.

CHECK POINT: Members of U. S. team check details of ore sintering machine at works in Sverdlovsk, top right. Reds talked freely about plant layout and equipment.

LABOR: U. S. Steel's J. A. Stephens, right, with Russia's top labor man, V. V. Grishin, who heads All Union Central Council of Trade Unions.

MILL VISIT: U. S. delegates E. L. Ryerson and E. C. Smith of Republic Steel, discuss costs and production at steel plant office in Chelyabinsk, bottom right.

survey, the American production and technical executives accumulated valuable technical and production data from first-hand observations and long discussions with Russian experts.

For a more detailed account of the Russian inspection trip, see The IRON AGE, June 19, '58, pages 69 to 74.







BRISTOL BRASS' JOSEPH O'BRIEN: "Brass mills should lead the business upturn."



AMERICAN BRASS' RICHARD M. STEWART: "We are spending more than ever on promotion."

The Brass Mills' New Approach

Top management has shifted most of its thinking to basic, long-range problems.

They are coming up with imaginative solutions. Creative selling is one answer.—By F. J. Starin.

 Despite sub-par sales, there is a definite tone of confidence among top brass mill management in the Connecticut Valley, brass capital of the U. S.

The reason: They now believe they have in pretty sharp focus the basic problems that must be met if they are to realize their full potential.

Creative Selling—Almost without exception the mills are making some imaginative and dynamic moves aimed at this goal.

The larger mills with extensive

product lines, and many of the smaller, are putting the emphasis on creative selling—selling brass mill products where they weren't used before.

Mill heads are generally satisfied with their progress in developing new markets, but expect to make even more dramatic gains. The key, they say, is how close a link they can forge between sales, and research and development staffs.

Closer Cooperation — They are pulling out the stops. Almost all budgets have been slashed overall, but few mills will spend less this year on sales or R&D, many will spend more.

One mill has completely reorganized its sales staff along product rather than market lines, so that "salesmen can better interpret their sales requirements to R&D staffs." A major independent mill is operating with no regional or product sales managers. Field salesmen communicate directly with headquarters in order to cut time-consuming red tape.

Other Moves — A smaller mill with a restricted product line has launched a youth movement, plans to train salesmen about six years before they are put on their own.

And still another mill has launched "Operation Customer"— an all-out, drive by sales and technical people to give better and faster service.

The president of one independent mill says he is banking heavily on R&D, but cautions that it is actually not new to the industry. He points out that technical progress — more purity, bigger sizes, new alloys—has been responsible for the overall growth of the

brass industry since World War II.

R&D Progress—For instance, an R&D team came up with techniques for fabricating safety razors to 1/10,000-in. tolerance so that a major maker can use brass to make three models with different edge exposures at no appreciable increase in cost.

Mill managements think they have some items right now that will open up new markets. Near the top of the list is drainage tube for residential housing. Chase Brass & Copper Co. compared the cost of installing a copper drainage system with the traditional cast iron. They figure the savings at about \$39 for a six-room house.

New Market — The top sales executive of another mill points out one reason copper drainage tube is cheaper is because the weight advantage permits more of the fabrication to be done in the shop.

A major stumbling block is that many building codes do not permit copper. But the industry is succesfully sponsoring change.

In what direction is the industry going? The top executive of one major mill expects architectural and electronics fields to be prime targets for new shapes and alloys now in the works.

More Promotion—Another area for action is promotion. "We must completely overhaul our industry promotion program," insists a mill executive. He points out that the Copper & Brass Research Assn. campaign to get manufacturers to affix "solid brass" stickers to their products failed because the fabricators found their customers just didn't know the real difference.

"We are losing markets to competitive metals because we haven't told the consumer our story," says another. He points out the light bulbs with brass bases last 30 to 40 pct longer than bulbs with other metal bases. But this market is completely lost because the consumer doesn't know this and is not insisting on brass.

Probably—The promotion problem has been kicked around before by the industry. But this time the top echelon appears to be ready to push for some action.

Most likely is a high-priced, high-powered campaign through CABRA, with the copper producers being asked to pick up a big part of the tab. This could be a stumbling block. Producers admit they have some responsibility to promote brass mill products, but some just aren't ready to spend any more money right now. One copper executive indicated his action would depend on what an extensive market research job revealed.

Import Problem—Increasing import competition is causing some lost sleep around the industry. A major reason imports are able to undersell domestic brass mill items is the lower labor cost overseas, say U. S. mills. One mill president says his average gross pay rate is \$2.70 per hour, far above foreign mills. An executive vice president of another mill puts U. S. wages at between 4 to 1 and 10 to 1 above any foreign mills.

Some mills have tried to meet the problem head-on by cutting prices along with the imports. But they are reaching the no-profit level, while many importers still have room to cut.

Price Picture — Mill chiefs are also pondering the possibility of a more stabilized price picture. They say it would definitely help bring in more customers. But most think this is almost an impossibility. The reason: Speculation in copper. "The LME (London Metals Exchange) is the biggest crap game in the world," says one mill head.

Several have suggested that an increase in the copper producers' ability to produce might help. But a high executive in one of the major producers calls this economically unfeasible. Too much copper would not stabilize a market, he says. And it costs too much to develop a property and then not mine the metals.

Aluminum Makers Will Ask Tariff Hike

• It is becoming increasingly clear the domestic aluminum producers are gathering strength for a concerted drive for protection from imports.

But the trade is not quite sure whom the producers want protection from.

World Wide—On one occasion D. Wilmot, Alcoa vice president, complained about the lower labor cost advantage of foreign producers, made comparisons between the U. S. and Japan, Italy, Netherlands, France, and West Berlin.

And earlier this month, Sen. John D. Hoblitzell, Jr. (R., W. Va.), read into the Congressional Record a statement laying the blame at the door of "Soviet economic warfare." He said Russia put the pressure on the British market, forcing Aluminium Ltd., to lower its price.

"Russia could thus use Aluminium Ltd.'s world wide marketing system to weaken all free world markets," he said.

Aluminium Ltd. has already said that it did not lower the price earlier this year to meet Russian competition, because Russia has indicated that no matter how far the Aluminium price is dropped, it will sell cheaper.

Looking Northward?—Some observers believe the producers are aiming to minimize the Canadian producer's ability to buck a price hike.

These observers point out that this is why the producers appear to be in haste to get an organized case before Congress. Others say it is merely to get a tariff hike tagged on to the Seaton Bill and make 'passage easier and quicker.

At any rate, the issue is far from cut and dried. The Aluminum Extruders Council is vigorously opposed to any tariff hike. And aluminum is playing a bigger part in the Canadian economy, so an official protest from north of the border is likely.

U. S. Steel Delays Price Boost

But It's Only a Reprieve, Not a Pardon

Here's the story behind U. S. Steel's holding action on prices.

Odds now favor an increase before Sept. 1 to offset higher wages.—By Tom Campbell.

■ In its attempt last week to clarify the steel price situation, U. S. Steel Corp., succeeded in confusing the picture further. Few market observers and steel leaders were sure just what the Corporation's officers were trying to say. This is an attempt to clear the air.

This week U. S. Steel top executives have five balls in the air. They must be handled correctly. To must one would be to have one or all of the others come down upon their heads. Corporation people are frustrated that more outsiders don't know that there is more to running a steel business than answering Sen. Kefauver's daily blasts. The latter, known as Kefauver's U. S. Steel "count down," are to come to an end July 1.

Beneath the Surface—But there is more to U. S. Steel's cryptic news release than appears on its uneven surface. First there is the company's responsibility to the economy. It answers this by a flat statement that there wouldn't be any price discussion if it were not for wage increases coming up on July 1. That is the first ball. It lays the blame for the probable price increase upon the union which has no intention of foregoing its wage benefits.

The second ball is U. S. Steel's customer relations. As in the past steel users put pressure on U. S. Steel to hold the price line. Many argue that the market place won't stand a price increase at this time. U. S. Steel's answer is that it must raise its prices if wages go up because it can't absorb all of the wage

boost cost without financially impairing itself. It hasn't money to throw around, in view of the \$330 million it is to borrow and which it must pay back.

Competitive Angle - The announcement barely mentioned the company's third ball in the air: Competition. Yet the company's statement was a thinly-veiled warning that it is and will continue to remain competitive-in Detroit or any place else. The recent steel price reductions in their respective areas by Granite City Steel and by Great Lakes Steel required costly and prompt meeting by U. S. Steel so as to remain competitive and hold its customers. By dragging its feet on its price decision, U. S. Steel is signifying that it isn't a "pushover" in price leadership.

A hard ball to handle, too, is Sen. Kefauver's "countdown." The Senator is blasting daily at U. S. Steel on the Senate floor, conveniently overlooking the fact that the steel wage increase is set for July 1. The Senator was bested by U. S. Steel Board Chairman Roger Blough during the recent steel price investigation. But U. S. Steel feels it has to answer the Senator's latest maneuvers in some way.

Industry Leader—The fifth ball which U. S. Steel must keep in the air is its responsibility to the steel industry. In its zeal to fight on all sides it must, because of its leadership, be mindful that what it does can seriously affect all other steel firms. From a practical standpoint no other major steel company can replace U. S. Steel as a price leader.

No other steel firm will announce a price increase July 1 if U. S. Steel does not. It is now a pretty good bet that when Sen. Kefauver's countdown comes on July 1, his rocket won't leave its pad and he will have to make readjustmentsbecause U. S. Steel will not find the price situation "clarified" by July 1.

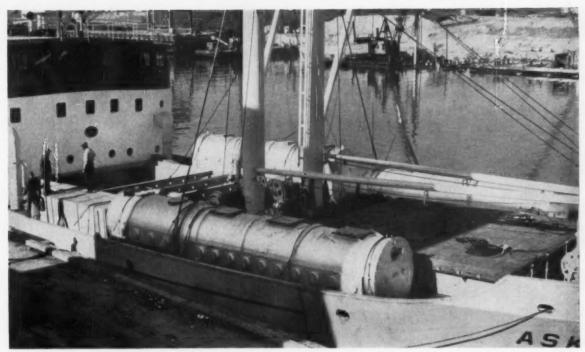
What it Costs—After July 1, the direct cost of steel will be up about \$5.25 a ton, due to higher wages. And the subsequent indirect cost (materials, services, freight, etc.) will be up about the same amount. It is unlikely that U. S. Steel can absorb a \$10-\$11 per ton increase. But at the same time it may forego compensating the indirect increase in its costs and raise the price of selected steel items to offset only the direct wage cost boost.

While they try to make up their mind on price policy, U. S. Steel officials must take a close look at the market place: What is competition doing to steel prices? And what happens after U. S. Steel raises prices? This confusing picture and the day-to-day "taking a look" will be painful to U. S. Steel, other steel firms, and to all steel customers. The latter won't know when there will be an increase; how much.

The confused price situation has put steel consumers on tenter hooks, at least those who want to beat the steel price increase. And shutdowns will make it difficult for those who did not get steel in June to take in very much tonnage in July.

The Odds—The odds are 100-to-1 that there will be a price increase; 80-to-20 that the increase on a selective basis will average about \$5.50 per ton. The same odds indicate that this price advance will be put into effect by U. S. Steel and other producers sometime after July 1, but before Sept. 1—unless Dave McDonald foregoes his wage increase; and that is the miracle which U. S. Steel does not look for.

It is clear and the odds are 100to-1 that there will be no price increase July 1.



VENEZUELA BOUND: Three Selas gradiation heaters are made fast on ship's deck before leaving Houston.

Small Firm Profits From Export

■ A producer of industrial heating equipment, employing about 500, is proving that it pays for a small company to develop a long-range export policy.

After six years planning and laying the groundwork with overseas licensees, Selas Corp. of America, Dresher, Pa., this year is doubling its income from overseas operations at a time when domestic orders are in a slump. Since 1955, the company's export business has grown 500 pct.

Business Is There—Frederic O. Hess, Selas president, regards forcign markets as a source of huge sales potential—markets that must not be neglected by American industry if it is to retain its position of world leadership.

"Too often," says Mr. Hess, "American companies go after foreign business only when domestic sales are off. They regard it as a nuisance. When domestic orders begin picking up, they drop their foreign customers and concentrate on the home market."

Good Faith Needed—Foreign industries resent such shabby treatment, says Mr. Hess, and we lose a lot of good will. "Nobody likes to be treated second hand," he adds. To develop really sound foreign markets he advises that we must "trade in good faith." Otherwise, our trade relations will suffer at the hands of competitors.

In 1952, when Selas began developing foreign markets in earnest, it decided that the soundest approach was to sell its "technical know-how," or in other words, its designs and processes.

Plan, Then Action—Says Mr. Hess: "You can't profitably ship steel and brick to Europe." So instead of shipping products overseas and competing with low cost foreign labor and materials, the Selas plan was to license its U. S. patents to foreign firms.

"By doing this we automatically acquired a policing agency for our patents in that country plus a readymade servicing organization," Mr. Hess points out. Selas now has licensees in 19 nations.

Solving Patent Problem — He adds that it is almost impossible for a small American company to police its foreign patents without undergoing tremendous expense.

"Taking out a foreign patent is one thing, but enforcing it is another," he says. Licensing bypasses this problem. And it also is better economics.

A foreign firm making your product hires local labor, buys most of its supplies locally, and stimulates the country's buying power, explains Mr. Hess. This in turn strengthens your foreign market.

How Sinter Boosts Steel Growth

U. S. Steel's Plans Point Out Industry Trend

Corporation has sintering plans that could boost blast furnace capacity by 15 to 25 pct.

It could mean changes in steelmaking, with new emphasis on use of oxygen. — By G. J. McManus.

■ U. S. Steel Corp.'s massive expansion program took a quiet but important step forward with its new 5000-ton sintering plant at Youngstown.

Built by the Dwight-Lloyd Div., McDowell Co., the new line employs a traveling grate 185 ft long and 8 ft wide. It takes the ore fines mixed with coke, ignites the mixture, and fuses the ore into clinkerlike chunks.

Saves Fines—Purpose of sintering is to improve blast furnace efficiency. With most ores, foreign and domestic, running about 70 pct fines, sintering is necessary to fuse the fines, which would tend to blow out the blast furnace stack.

Charging a blast furnace with sinter and coarse ore can increase blast furnace yield a conservative 15 pct. Coking rates drop sharply.

The result for the Youngstown plant will be to add iron-making capacity equal to about one-half a blast furnace. Capital cost will not be much less with sintering than with a blast furnace. But sintering conserves iron ore, reduces coke

and operating costs.

Big Picture — The Youngstown installation is part of a broad sintering push at U. S. Steel. The Corporation is now operating a 4000-ton plant at the Fairless works, is building another 5000-ton unit at South Chicago. Three 5000-ton lines are being built at Saxonburg near Pittsburgh and three at Gary.

When these plants are completed in early 1959, it's figured that the iron-making capacity of the group will increase by at least 15 pct and possibly 25 pct.

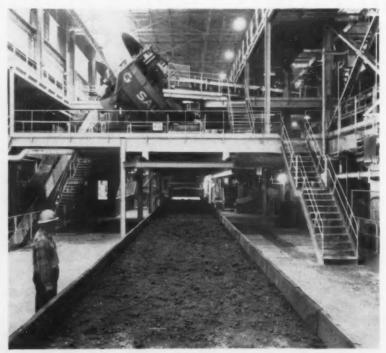
Hot Metal Plans—The question: What will U. S. Steel do with its added hot metal? Part will probably offset losses from retired equipment.

But much of the added supply seems destined for steel furnaces that have been souped up with oxygen. An indication of this came recently with announcement that Linde Co. was building a 1000-ton oxygen plant to serve four U. S. Steel mills near Pittsburgh.

Refractory Break Through—Another indicator is the persistent rumor that U. S. Steel has made a key breakthrough in the field of openhearth refractories.

If this turns out to be true, the Corporation will be in a position to really pour both hot metal and oxygen into its openhearths, with a light scrap charge.

U. S. Steel's sintering activity is closely paralleled in the rest of the industry. It's estimated that current projects will give steelmakers 60 million tons of sintering capacity. Significance is that the industry may be able to add 30 to 40 million tons of capacity without building new blast furnaces.



HEATING UP: Hearth area of world's largest single unit sintering machine is shown here. Located at U. S. Steel's Youngstown District works, it will produce 5000 tons of sinter a day for plant's five blast furnaces.

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Pittsburgh Civic Arena to Have Stainless Retractable Dome



CLOSED: Drawing shows all-weather dome closed. Stainless steel was selected by five-man Public Auditorium Authority. Sheathing will cost \$890,000.



OPEN: The \$20 million Civic Arena will go up near Pittsburgh's Golden Triangle. Limbach Co. will fabricate the covering. Capacity, 14,000.

Senate Votes to Cut Freight Taxes

Transportation tax repeal efforts in Congress are about to pay off. The Senate has voted to end the existing 3 pct tax on freight shipments and the 10 pct tax on passenger travel.

The House of Representatives, in passing legislation to extend corporate and excise tax rates, failed to tack on an amendment for repeal of transportation excises. But the Senate voted strongly for such an amendment. And there is good chance that the Senate will prevail in the final voting on the bill by Senate and House leaders.

The Senate vote to end taxes on freight shipments and passenger travel was an upset for the Eisenhower Administration. The Administration and leaders in Congress had agreed to keep intact the present tax arrangement.

World Steel Output

World steel production rose to a record total of 322 million net tons in 1957, the Department of Commerce reports. It's 11 million tons higher than the 1956 level. The

U. S. was responsible for 35 pct of the output.

Preliminary statistics for the first quarter of 1958 indicate that the slowdown in this country will interrupt the upward trend. World production for the three months was at the annual rate of 290 million tons—the lowest level since 1954.

Granite City Expands

Granite City Steel Co.'s rated steelmaking capacity will increase 120,000 tons on July 1, to a total of 1,320,000 net tons. The increase reflects partial completion of an expansion program that began two and a half years ago.

By the end of 1959, Granite City's annual capacity is expected to reach 1,584,000 tons.

Workers Spurn Raise

In Youngstown, employees of the McKay Machine Co. voted to pass up a scheduled July 1 wage hike to help the company in a strong competitive position. The 83 pct majority vote followed a promise by Pres. A. J. Wardle Jr. that discussion would be re-opened in six months.

Mesabi Is Sued

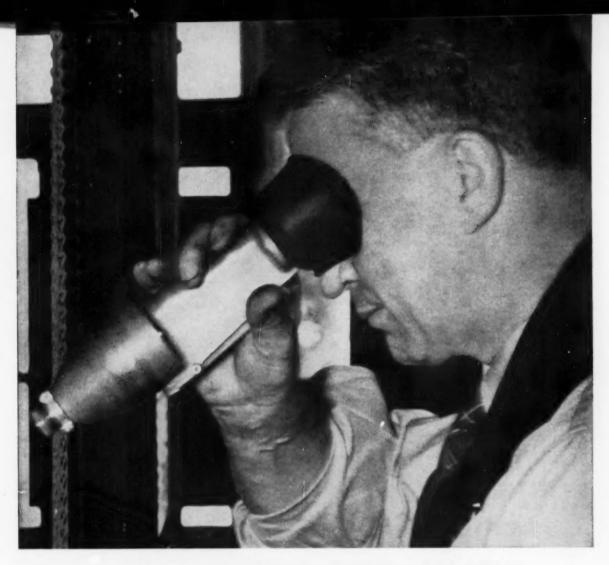
Reserve Mining Co. filed suit against Mesabi Iron Co. in the District Court of St. Louis County, Minn. charging Mesabi with ignoring an arbitration clause in the lease from Mesabi to Reserve of the taconite lands near Babbitt, Minn.

The suit seeks a mandatory injunction requiring Mesabi to continue arbitration proceedings begun last year on matters in dispute between the companies. It also seeks to prevent any other action relating to those disputes until final decisions are reached by arbitration.

Tool and Die Labor

Contract between the Automotive Tool and Die Manufacturers Assn., Detroit, and 7500 UAW members of locals 155 and 157 has been extended indefinitely, it was announced by Chester A. Cahn, managing director of the association.

The contract was to have expired June 20. Under the extension terms, the contract remains unchanged but agreement is cancellable on 10-day notice by either party.



won't quit 'til he sees results...

That's the "difference" in Houghton heat treating salts.

Heat treating salts are something like a highway . . . no good to you unless they take you where you want to go. You buy for results, not a price per pound.

That's why it has always been Houghton's policy to make sure Houghton heat treating salts give you the results you want. The Houghton man not only makes recommendations; he sticks with the job, stays right on top of problems until they're solved. This kind of experience has given Houghton the solutions to many hundreds of problems in salt bath heat treating. Out of it have come new salts and new ideas for better control of heat treating results.

Write for the "liquid Salt Bath" book today. A new printing is now available. E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia 33, Pennsylvania.

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NUCARB

"Non-burning"

QUICKLIGHT

Various types of binders and

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Salt Bath Materials:

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Liquid carburizers.

LIQUID HEATS

For hardening, annealing, preheating and treating all steels, including high speed

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For drawing and tempering.

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For interrupted quenching, to minimize warpage and distortion.

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Ready to give you on-the-job service . . .



It's another step forward by Electromet research to make metals more useful and versatile. The new Permyron process gives durable, decorative finishes to stainless steel and other metals. The coloring produced by this process withstands the rigors of fabrication and forming as well as the ravages of time and weather.

ELECTROMET is offering this metal-treating process to metal producers and fabricators on a license basis. A matte black finish is now available and additional colors are under development.

This process is another example of how ELECTROMET is constantly working to improve the metals of today and develop the metals of tomorrow—in ferro-alloys, pure metals, intermetallics and metal chemicals.

ELECTRO METALLURGICAL COMPANY Division of Union Carbide Corporation 30 East 42nd Street, New York 17, N. Y. Electromet

UNION CARBIDE

The terms "Electromet," "Permyron," and "Union Carbide" are trade-marks of Union Carbide Corporation

Bay E. Estes

Getting More Out of Marketing

The nation's largest steel company is unifying four marketing functions under one chief.

With Mr. Estes calling the shots, it may set a new pattern for industry.

■ Into its new post of vice president, marketing, U. S. Steel Corp. has moved one-time Harvard track star (4:20 miler) and long-time market researcher (since 1939), Bay E. Estes.

U. S. Steel hopes that the fastgrowing but hazy notion of industrial marketing will take on clearer lines now that its advertising, commercial research, product development, and market development divisions are in the hands of a single marketing chief.

At Work and At Play—A quiet, contained man in private talks, Boston-born Bay Estes is considered one of the best public speakers at U. S. Steel. He looks more like an athlete than a business executive. In his spare time he coaches a high school swimming team and is an ardent gardener.

But at U. S. Steel headquarters in Pittsburgh, he is hard at work cultivating a streamlined marketing program. In the new alignment. Mr. Estes sees commercial research putting more emphasis on specific marketing projects and making greater use of specialized agencies. He feels one of the biggest achievements of research has been to recognize and measure the effect of inventories on steel sales, a point that is emphasized in effects of current inventory policies.

Prefers Growth-Market devel-



BAY E. ESTES: Better to have the same share of a growing market.

opment has proved its value in steel selling, he feels. Does a company lose out when it promotes a whole market rather than push its own sales exclusively? Mr. Estes doesn't think so

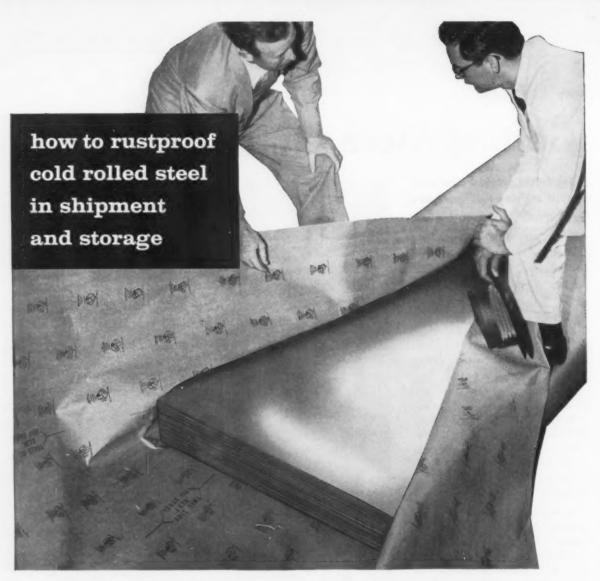
"It's sometimes better to have the same share of a growing market than a bigger share of a stagnant market," he points out.

A Game of Chance — Product development, as a formal division, goes back only 10 years at U. S. Steel. "A big part of the job is to know when to stop development," says Mr. Estes. At the same time, he recognizes the need for gambling. It's like the game of bridge:

"You aren't getting the most out of your hands if you never go down."

Advertising is a company-agency effort at U. S. Steel. The general policy under Mr. Estes promises to be simple and straight-forward. "Our advertising is commercial," he says bluntly. In consumer promotion, the corporation expects each dollar it spends to produce greater spending by makers of end products.

Setting the Pattern—The grouping of these four divisions under Mr. Estes climaxes a 10-year build-up that has doubled the size of marketing functions at U. S. Steel.



Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong,

yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4805 South Whipple Street, Chicago 32, Illinois.



How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary



How to rustproof black plate — On this fight gauge, dry, unsuated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity sours!



Can Low Inventory Policy Last?

Most companies are determined to make improved delivery take the place of large inventories.

It's been done before, but many were hurt in the rush. Now the drive to maintain low levels is stronger than ever.

You've heard it all before, but now there's a strong probability that it will stick. This is the avowed determination of most industry to keep inventories at a permanently low level.

It's a periodic state of mind. Many of those who are most vocal in stating a bare minimum inventory gospel today were among those who swore "never again" when they were caught with heavy orders and low supplies in 1955.

Capacity Can Adjust—But the feeling is strong through most segments of industry that productive capacity is large enough to readily adjust to even a strong upturn without creating severe shortages of materials.

With little chance of a really strong business upsurge in the immediate future, consumers are determined to make their suppliers shoulder more and more delivery responsibility. With consumers in the driver's seat, it's likely they can make it stick.

Trend Widespread — This trend is evident throughout all industry, from the supplier of basic materials through retail. If you want to do business, it will have to be more and more on the customer's terms.

There is a limit to this line of thinking, of course. Sensible firms, even with strong inventory control policies, realize there is a point where it is both unrealistic and uneconomic for a supplier to assume warehouse functions.

Strong Pressure — At the same time, with the profit squeeze on from every corner, the pressure is on every plant to save what it can on inventory costs.

Both suppliers and users of metalworking products have long called for an end of the feast-or-famine situation that has existed for so many years. Possibly some progress toward a long-term solution may result.

Steel users have a built-in safety factor in steel warehouses. In fact, most steel users will lean more heavily on warehouses in attempts to keep inventory costs down in the future. (IRON AGE, June 19.)

FRB Index Ends 8-Month Drop

Only a week or two ago it was considered optimistic to predict a one-point upturn in June in the FRB Index of Industrial Production. Now, that's the conservative outlook.

It was apparent in May that production rates had started to turn. The May index rose to 127, up a point from 126 in April. It was the first halt in a steady decline since last summer. The June rate could be two to three points higher.

Best for Metalworking—The encouraging fact about the May upturn, slight as it was, lies in the source of strength—in the durable goods areas, both of manufacturers and consumers goods.

Manufacturers' products rose one point between April and May, while consumer durables climbed from 98 to 103, a five-point increase. Primary metals increased five points, metal fabricating two points. (All the above figures are on an adjusted basis.)

Can It Last?—It would be wishful thinking to believe the rate will hold in July, particularly in view of the sagging steel orders and the

questionable auto picture.

But business has every reason to be encouraged. New orders can still stand improvement for most industries, but the moderate pickup appears to be widespread.

Help Needed For Freight Car Makers

Unless government aid helps out soon, the freight car program will be out of business.

Although a pickup in orders was reflected in April, the backlog is fading fast. Production has been cut back substantially, but deliveries are far ahead of orders.

Backlog dropped from 97,006 a year ago to 30,386. Over the past few months, orders have varied between 200 and 300 per month, although they jumped to 1372 in April.

At the peak, deliveries were being made at over 7000 per month, but have now dropped to 3534 in May.

There's little doubt but that the roads need the cars, but will need some relief in order to finance new programs.

Are Our New Roads Obsolete?

Expert Sees Need for Longer-Range Planning

A new road is a costly undertaking. Once built, it must last many years.

Is enough research going into safety, volume, and speed factors?—By H. R. Neal.

Are highways being built under the National Highway Bill destined to become obsolete within a relatively few years? Louis C. Lundstrom, director of General Motors Proving Grounds, believes that danger exists.

Consequently, he has called for engineers to take a "new objective look" at both vehicle and road designs. These, he says, "should be studied and modified, if necessary, to attain most satisfactory and safe movement of . . . people and motor freight over our present roads and those we are starting to build for the future."

Curves Must Go—Citing the past to direct the future, he said: "When our wagon and first auto roads were following Indian trails, the railroads were farsighted enough to obtain relatively straight alignments with the result they successfully operate at higher average speeds, although motor vehicles now have higher top speed. Airplanes, ships and even the Romans on the Appian Way traveled the straight route and our

future roads will become obsolete quickly if too many curves are included."

Unfortunately, he says, highway engineers must sometimes use minimum specifications for economy, although low-standard roads promote accidents and high-standard highways tend to reduce them.

Price Tag High—He admits the high cost of future highways "is staggering even to the engineer's widest imagination." Nonetheless, he suggests a comprehensive study of the entire automotive transportation system, together with interstate, primary, secondary, and urban road systems.

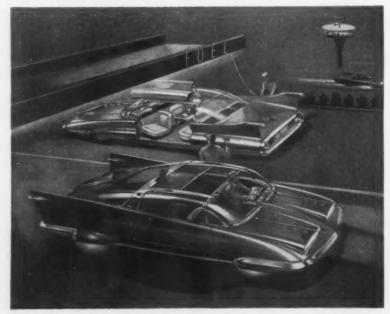
For one thing, the GM Proving Grounds director questions whether 1975 highways should be designed for a maximum 70 mph speed limit. "Future vehicles on properly designed roadways undoubtly could be driven safely at higher speeds and certainly will operate at higher average speeds," he contends.

Speed Hypnosis—He points out, however, that although the new thruways permit "a greater amount of constant speed driving than we have ever experienced before," this brings up "the additional problem of inactivity, monotony and drowsiness."

GM Proving Grounds have a drowsiness problem with test drivers, Mr. Lundstrom admits. However, they are experimenting with "awakening" strips near the edge of the road.

These strips, he says, "would ideally be cast into the original surfacing material at least two or three feet from the edge and center of the road and in a corrugated pattern to

How They'll Look 20 Years From Now



NOTICE A DIFFERENCE? Look closely, and you'll see that Detroit designers envision cars with no wheels. They'll ride on jets of air, instead. Most automakers already have models in development stage.



Welding reduces bridge costs

Calvert Iron Works, a leading bridge builder in the Southeast, reports reducing construction costs by using arc welding instead of riveting. New techniques and improved electrodes have made welding a practical and more economical means for fabrication.

New M&T "Murex" electrodes help make the difference. Calvert considers them best for their work, reducing welding time and practically eliminating X-ray rejects. Information about these and more than 1000 other types and sizes of Murex electrodes are given in catalog ESC, available on request.

It costs little to guard working parts

To millions everywhere, SINGER stands for quality in sewing machines. One doesn't "toy" with such a reputation. So, daughter's machine gets many of the fine construction details found in mother's. Working parts for both get extra resistance to wear and corrosion with Unichrome SRHS Chromium plating.

Literally hundreds of thousands of small parts are quality finished each day at minimum cost — a feat made feasible because of the self-regulated high speed operation of the bath; and the Unichrome Chromium Plating Barrel, the first successful production equipment of its type. Send for data on both.





Vinyl coating stands rough abuse

Products coated with Unichrome Plastisol can be dropped, bumped, exposed to acids, alkalies and other corrosives — all without damage to the finsh.

Unichrome Plastisols are vinyl compounds that form a tough, seamless, resilient, protective thick skin. Coating won't chip, crack, tear, peel, scuff or blister; can be applied to products of bakeable size by spray, dip and other methods. Send for Bulletin VP-3.



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Automotive Production

WEEK ENDING	CARS	TRUCKS
June 21, 1958	81,359	17,026
June 14, 1958	78,163	17,403
June 22, 1957	118,805	22,729
June 15, 1957	125,372	22,748
TO DATE 1958	2,139,800	427,400
TO DATE 1957	3,247,100	555,000
*Preliminary	Source: War	d's Reports

produce a definite rumble when a sleepy driver permits his car to drift from the normal path."

Better Surfaces Needed—He also urges a study of pavement surface wear. Some pavements, he points out, wear smooth and can't be recognized by the casual driver. These slippery areas are the cause of many intersection accidents, he claims.

Mr. Lundstrom suggests study of traffic lane widths, explaining they usually are kept to an absolute minimum for economy reasons. GM Proving Grounds experience shows wider lanes offer a definite safety advantage.

Any number of factors will continue to cause vehicles to swerve from their traffic lane—driver error, drowsiness, ice and snow. But he believes the dangers of head-on and sideswipe collisions can be eliminated by designing roads for one-way traffic.

Trees Are Hazards—"Safe roadsides" are an equally important problem, he believes.

"Since the dawn of civilization trees have been planted along road-ways. Now with motorized vehicles they have become a serious hazard. Impacts with trees at even 25 mph can produce serious injuries," he says.

For one solution to this problem he suggests landscaping with shrubs and brushes. In addition, he says, these would create a tolerable deceleration barrier. Utility, light and signpost poles should be made of light enough material to "yield on impact." Even guardrail structures are being evaluated at GM Proving Grounds for their safety or danger potentials.

Ditches Too Deep — There are ditches beside practically every roadway in rural areas, including state highways and interstate superhighways. The Proving Grounds director contends contours or profiles of these need not be so steep that injury or death will result whenever a vehicle swerves off the road.

These profiles can be flattened, Mr. Lundstrom says, so they are no longer a hazard. In this connection, he adds, engineers should utilize all available right of way so as to provide motorists with the safest road-sides possible.

The Year 2000—GM's engineers are looking ahead 50 years as well as 25 years for solutions to the nation's highway problems. They suggest elevated superhighways with monorails suspended beneath them may carry intercity motorists and train commuters in the year 2000 on a single, rifle-straight "transportation core in the sky."

This concept has been introduced as an operating model in one of the GM exhibits at the Brussels Universal and International Exhibition. The "transportation core" is tri-level. The top two levels are three-lane, electronically controlled highways, one carrying traffic in each direction. Beneath the lower highway is suspended a two-way monorail commuter train system.

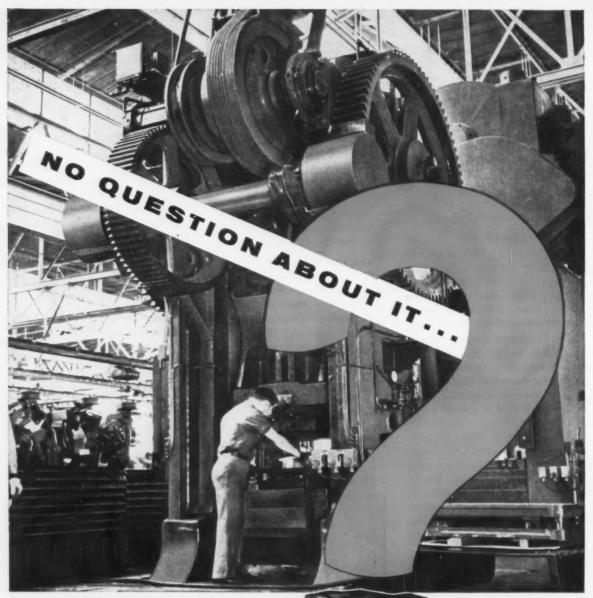
Ultra-Safety Seen — The entire tri-level "core" is set like ladder steps between pairs of pillars which vary in height with the terrain to keep the "core" straight. It eliminates curves and hills, fords rivers and urban areas, and tunnels through mountains where necessary.

GM's advance thinkers say such highways would be ultra-safe because all vehicles would be under complete electronic guidance.

Land Savings — GM president Harlow H. Curtice says, "The elevated transportation core would allow intercity passengers to travel in a straight line with maximum speed and safety plus unparalleled vision. In addition, it would free land below the highways and monorail for farming, housing, and industrial use."

THE BULL OF THE WOODS





Bituminous is the dependable fuel for



plant power

- Is it readily available?—Yes, it's yours on order!
- Is there enough for any future need?—Sure thing, the supply is practically limitless!
- How about present and future cost?—Price is stabilized by expanding mine mechanization and increasing efficiency of modern burning equipment.



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How Reds Win Economic Victory

Trade Is Used as a World Political Tool

Red foreign aid and trade program is winning much greater good will and prestige.

Economic gains are sacrificed to win political victories around the world.—By G. H. Baker.

• There's little cause for joyful good spirits around the White House these days.

Besides being embarrassed over Sherman Adams and the gifts he accepted, Ike's top-level planners are fretting over a new State Dept. report spelling out some bold and effective recent Soviet advances in the U.S.-U.S.S.R. economic war.

No Suggestions—The State Dept. report offers no new ideas on how to combat Red gains in prestige around the world. It simply outlines, in grim style, how the Russians are winning friends and influencing people at our expense.

Russia has expanded her foreign trade enormously in the past several years. This trade is not profitable. Says Mr. Khrushchev, "We value trade least for economic reasons and most for political purposes."

The prime purpose of Russian foreign aid and foreign trade is to gain in influence, in prestige, in good-will. Arms and military supplies are either given free or sold at low prices. Loans to foreign countries are at very low interest—usually 2 pct. (See Table.)

Technicians Too—When Russia gives or sells expensive equipment like steel-mill machinery or a chemical plant, capable technicians are sent along to make sure the job is done properly.

Here are some recent examples

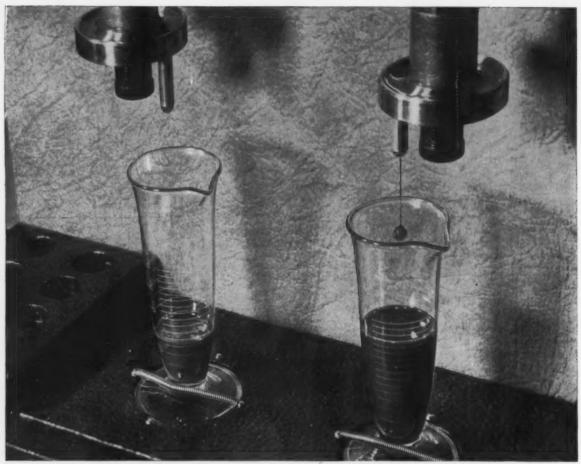
of Russian gifts. Note the favorable terms. And keep in mind that Russian projects are all clearly identified by means of signs and propaganda devices as gifts or loans from Russia. American aid is not identified.

It usually looses its identity when it leaves U. S. ports. It gets swal-

lowed up in the mulch of the foreign economies it enters. Samplings of local opinion show that few foreigners are aware that U. S. foreign aid is entering their economies. But the sample shows people are very much aware of Soviet aid, because the Reds are careful to fully identify their projects.

Red Foreign Aid Pattern

Country, Amount, and Interest Rate	Period	Means of Repayment
India—U. S. S. R.— Feb. 8, 1955 \$132.2 million (Bhilai steel mill) 2.5 pct interest	First payment due 1 year after each consignment; 12 annual payments	Rupees of present gold content
Afghanistan—U. S. S. R.— Jan. 28, 1956 \$100 million 2.0 pct interest	First payment due in 8 years; 22 annual payments	"Afghan export goods"
Indonesia—U. S. S. R.— Sept. 15, 1956 \$100 million 2.5 pct interest	First payment due 3 years after each fractional credit; 12 annual payments	Goods or sterling or con- vertible foreign exchange at rate of exchange of the dollar on date of repay- ment
India—U. S. S. R.— Nov. 15, 1956; implementation agreement Nov. 13, 1957; \$126 million 2.5 pct interest	First payment due 1 year after entire enterprise; 12 annual installments	Rupees (presumably as Feb. 8, 1955, credit)
Syria —U. S. S. R.— Oct. 28, 1957 Estimated \$168 million 2.5 pct interest	(as amended) — First pay- ment due 1 year after pro- ject completed; 12 annual payments	Goods or freely convertible currency at rate of ex- change of ruble on date of repayment
Egypt—U. S. S. R.— Jan. 29, 1958 \$175 million 2.5 pct interest	12 annual payments after project completed	(Presumably similar to Syrian)
Syria —Czechoslovakia — Mar. 16, 1957 \$15 million (oil refinery) 3.0 pct interest	60 percent at specified times during construction; 40 percent in 7 years afterwards	23 percent Syrian lira; 77 percent sterling



The oils collecting in these graduates are being forced, at 100 psi, through two sintered bronze bearings. Although each oil has the same viscosity, the Suntac on the left is leaking only one quarter as much as the straight oil on the right.

Desk-top demonstration proves that SUNTAC HYDRAULIC OILS can cut your oil losses...up to 75%

Suntac[®] oils are competitive in price, competitive in quality, and unique in their ability to reduce oil leakage without costly shutdowns.

Suntac oils are high-quality, exceptionally stable mineral oils especially compounded to reduce leakage. Experience proves that they give longer pump and seal life with higher overall operating efficiency.

See for yourself how a Suntac oil can cut your oil costs. A simple desk-top demonstration will show you how. Ask your Sun man to show you how others have reduced oil consumption, or write to Dept. IA-6.

Industrial Products Department

SUN OIL COMPANY, Phila. 3, Pa.



In Canada: Sun Oil Company Limited, Toronto and Montreal

More Powerful Rockets Needed

Other Space Problems Discussed at Rocket Meeting

We need rockets 50 times more powerful, says the "father" of Atlas ICBM.

Space stations called unlikely, high temperatures plague nuclear rocketry.—By R. R. Kay.

Rocket engines 50 times more powerful than the largest we have now are a must if we are to meet the space age challenge.

This is the view of Karl Bossart, technical director of Convair-Astronautics, San Diego, sometimes called "father of the Atlas ICBM."

"We should begin work on bigger engines," he says. "If we're going whole hog in space we need them."

Unofficially, the Atlas produces 300,000 to 400,000 lb of thrust—five million to six million horse-power. It could be "beefed-up" tremendously, Mr. Bossart believes.

Rocket Talk — Some other highlights of the American Rocket Society's recent meeting at Los Angeles:

A super-giant rocket engine with six million pounds of thrust is needed to put a dozen men on Mars, opines George P. Sutton. He's president of the American Rocket Society, and manager of advanced design, Rocketdyne Div., North American Aviation, Canoga Park, Calif. His company makes the rocket engines for the Atlas, Thor, and Jupiter.

To Send Men—"If you want to send up several men for reasonably long periods, my solution would be a one-million-pound-thrust rocket engine," he says. The Air Force is reported to be working on one now.

Will space ships be assembled in space from parts rocketed from the ground? "Space stations are for the birds. It's hard enough to assemble parts in a shop where tools and equipment are readily available," Mr. Sutton insists.

Jackass Flats will be the test site, next fall, for ground-testing Kiwi, a nuclear rocket. That's the word from Dr. Norris E. Bradbury, director of University of California's Los Alamos, N. M., Scientific Laboratory. Reason for the test: To find out whether nuclear rockets would be suitable for space use.

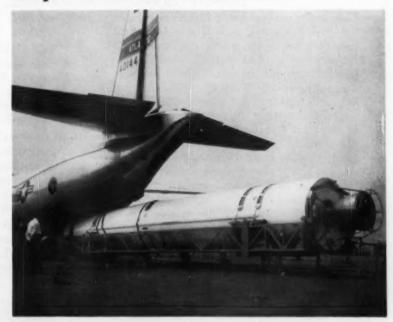
Temperature Tough Nut — Dr. Bradbury sees many problems ahead in nuclear rocketry. Big nut to crack is designing materials to withstand

temperatures of 2000°C to 3000°C.

"It would be wrong to say that the Russians are ahead of us," says Dr. L. A. DuBridge, president of California Institute of Technology. "They may have bigger satellites, but not necessarily better."

There's a Difference—Kraft Ehricke, a Convair - Astronautics scientist and one of this country's top spacemen, urges us not to wait for the Russians to call the shots. "We should not confuse the challenge of space with the challenge of Russia. This attitude gets us into the habit of depending on Russia, waiting for them to shoot something, and then trying to match it."

Cargo Plane Becomes a Missile Taxi



HITCHHIKER: To get its Thor IRBM to launching pads in a hurry, Douglas Aircraft Co. ships it in its C-133A Cargomaster airplane. In the works is the C-133B Cargomaster, to make missile handling easier.



THIS is No Ordinary Power Hack Saw Blade

This is the unbreakable MARVEL High-Speed-Edge Hack Saw Blade—the first bi-metal blade-invented, developed and introduced by MARVEL. This blade is a combination of two materials best suited to the requirements of an efficient hack saw blade . . . a narrow high speed steel cutting edge permanently welded to a tough, nonbrittle alloy steel body. Each blade is triple tempered to assure long life and maximum toughness to the cutting edge. Development of this high-speed-edge blade made it possible to cut any kind of material from the free machining steels to the toughest of alloys, fast, accurately and economically. Just one type blade to handle any job - no switching blades to cut different materials. Like all good things, attempted copies of this blade have been numerous, but its per-

formance has been unequalled by any of the imitators.

The MARVEL high-speed-edge hack saw blade can be tensioned from 200% to 300% tauter than any ordinary hack saw blade, a definite advantage which permits heavier feed pressures to be used without deflection or fear of breakage.

An extremely rugged cutting tool, this one type blade, the MARVEL High-Speed-Edge Hack Saw Blade, will cut any machineable metal with outstanding economy, accuracy, long life and complete safety—it is unbreakable.

Ask for MARVEL Blades by name and you can be sure you're getting the best on the market. Leading Industrial Distributors have them in stock.

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Write for latest cutting tool Bulletin and the name of your nearest MARVEL Distributor



ARMSTRONG-BLUM MFG. CO. 5700 W. Bloomingdale Ave., CHICAGO 39, U.S.A.

Surplus Tools Head for Schools

First Shipments by Government to Begin August 1

Up to 50,000 major tools will be loaned to schools by the U. S. in the next few years.

The plan will save the Government storage expense, help train youths.—By E. J. Egan, Jr.

• First shipments of surplus Government machine tools to educational institutions on an expanded "tools for schools" program will start this summer.

Government officials estimate the first tools will go out about August 1, and a heavy flow of equipment will be underway about two months later. In the first 12 months of the program, 5000 or more machine tools and related equipment items are expected to go to junior and senior high schools, technical schools, colleges and universities.

Demand Exceeds Supply — Officials of the U. S. Welfare Dept. judge that 25,000 to 50,000 major tools will be shipped to schools during the next few years, plus related equipment and smaller units such as hand tools. Business and Defense Services Administration officials put the grand total at 100,000 pieces of equipment of all types.

So far, schools in 40 states have put their tool needs for instructional purposes at more than 45,000 units. This presents Federal officials with a shortage problem even before the expanded school-aid program gets underway. For while the Government generates more than 13,000 surplus tools a year, only about 25 pct of these suit the schools' needs.

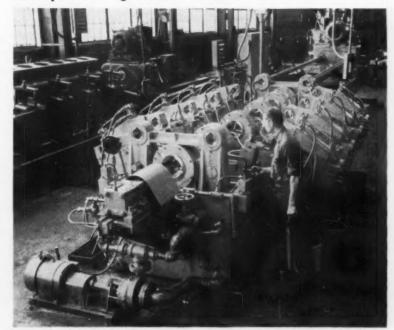
Many Benefits—In addition to the obvious benefits schools will receive through the expanded program, Federal officials point out several which the Government itself will derive: (1) relief from a storage burden; (2) avoidance of surplus sales which might affect both new and used machine tool markets adversely; (3) wide dispersion of tools which could help the country recover from an enemy attack.

Hydraulics Forum Airs Problems

Several discussions stood out as highlights of the recent Third Production Machine Tool Hydraulic Forum in Detroit, sponsored by Vickers, Inc. Topics of special interest were: The possibility of going to higher (up to 5000 psi) pressures to permit using more compact hydraulic controls and accessories on machine tools. Opinion was about evenly divided pro and con as to whether this would create greater problems of leakage and system maintenance.

The problem of hydraulic fluid leakage, which was stated to have cost one firm as much as \$90,000 in a single year. Participants in the discussion seemed to favor the new straight-type fittings over present pipe fittings for hydraulic lines, but at present there are no standards for the former. This could be a development at the next Joint Industry Conference.

Multiple Boring Saves Time



FOR V-TYPE DIESELS: Alco Products, Inc., bores channels for main crankshaft and two camshafts on this Moline Tool Co. machine.

INDUSTRIAL BRIEFS

New England First—Air Reduction Sales Co., a division of Air Reduction Co., Inc., has dedicated its new facility at South Acton, Mass. The \$9 million facility produces liquid oxygen, nitrogen and argon. It is the first of its kind to be built in New England. It will produce daily 75 tons of liquefied gases.

Moving Day — Mannesmann-Meer Engineering & Construction Co., Inc., Easton, Pa., will move its operating quarters to Youngstown, O., on July 15. The company will change its name to Mannesmann-Meer Inc.

Kaiser Research—Kaiser Aircraft & Electronics, a Division of Kaiser Industries Corp., has established an Engineering Research and Development Dept. It will be located at the Richmond Machining Plant, Richmond, Calif.

Missile Alloy—A new consumable-arc vacuum melted alloy, W-545, for high-strength applications at temperatures up to 1350°F, is now available from Westinghouse Electric Corp. Alloy is fabricated for use in high-stressed parts such as turbine wheels, couplings, shafts, valve stems, and bolts in missiles and gas or steam turbines.

Looking Ahead—Vitro Laboratories, W. Orange, N. J., has been awarded an ion propulsion contract by the U. S. Air Force Office of Scientific Research. Purpose is to investigate possible applications of the high intensity electric arc to ion propulsion.

Ready for Occupancy—Consolidated Electrodynamics Corp. has completed construction of two buildings for its Systems and Transducer divisions in Monrovia, Calif. Both divisions were formerly located in Pasadena. The \$1.5 million development occupies 13 acres of a 33-acre company site known formerly as the Monrovia Airport.

Turbines to TVA—Boiler feed pump turbines for a large steam electric power generating unit have been ordered by the Tennessee Valley Authority from General Electric Co.'s Small Steam Turbine Dept. The turbines will operate with a 500,000 kw steam turbine-generator unit which will be installed in TVA's Widow's Creek power station.

For Tired Pickle Liquor—Salem-Brosius, Inc., Pittsburgh, has acquired world rights to a new process for the reclamation of spent pickle liquor. Under a license agreement with Pantech engineers of Oil City, Pa., Salem-Brosius will engineer, manufacture and sell the Belle Fons Process.

For Premium Grades—A \$500 annual scholarship to assist students with limited financial means to attend Lehigh University, Bethlehem, Pa., has been established by members of the iron and steel scrap industry in Central Pennsylvania. Announcement came from The Central Pennsylvania chapter, of the Institute of Scrap Iron & Steel, Inc.

Push-Button Pipe — On June 20th, Johns-Manville Corp., Denison, Tex., opened the first continuous process asbestos cement pipe plant in the U. S. The plant, operated by electronic push-button controls, is an almost completely automatic factory.

Overseas Operation—The Landis Machine Co., Waynesboro, Pa., has purchased Maiden & Co., Ltd., Cheshire, England, a more than 100-year-old manufacturer of bolt and pipe threading equipment. New concern will be known as Landis Machine Maiden Ltd. The company will sell throughout the export market, though primarily in England and Continental Europe.

Chemists Elect—H. B. McClure, vice president, Union Carbide Corp., has been elected chairman of the Manufacturing Chemists' Assn. at its 86th annual meeting in White Sulphur Springs, W. Va. He succeeds Ernest Hart, president of Food Machinery & Chemical Corp.

AISI Librarian Honored—At the annual business meeting of Special Libraries Assn., held June 11, at the Hotel Sherman, Chicago, Mrs. M. H. Fuller, librarian of American Iron and Steel Institute in New York City, was installed as the 1958-59 president of the Association.

Reading Refinery—A copper refinery has been opened by Reading Metals Refining Corp., a subsidiary of Reading Tube Corp. It is located in Ontelaune Township, Pa. The new refinery makes possible Reading's participation in all steps in the copper fabricating business from blister or scrap copper to finished products.

Atomic Amplifier — Philco Research, Philadelphia, has developed a special type of gas Maser, also known as an "atomic" amplifier. The Maser study is being conducted for the Army Signal Engineering Laboratory, Fort Monmouth, N. J. It is part of the Army's pioneering work in this field.



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secretary-treasurer.

A. A. Hally, becomes vice presi-

dent, marketing, Campbell Chain Co., York, Pa.

A. M. Goodman, appointed chief inspector, Acme Steel Co.

C. A. Fox, appointed Pittsburgh district sales manager, Vulcan-Kidd Steel Div., H. K. Porter Co., Inc., Aliquippa, Pa.

R. E. Stanaway, appointed manager, Spectron Dept., Transducer Div., Consolidated Electrodynamics Corp., Monrovia, Calif.

H. B. Jackson, appointed general sales manager, Clemson Bros., Inc., and its affiliate, the Victor Saw Works, Inc.

W. H. Mouquin, appointed manager, New York district office, The De Laval Steam Turbine Co., Trenton, N. J.; C. E. Cromwell, appointed manager, commercial sales; A. L. Foltz, Jr., appointed manager, Chicago district office; J. F. Donovan, appointed manager, Detroit district office.

G. T. Wohlert, appointed asst. superintendent, Dravo Corp.'s Engineering Works Div. Boat Yard at Neville Island.



L. E. Eberts, elected vice president and asst. export manager, The Cincinnati Milling & Grinding Machines. Inc.





G. M. Burrier, named works manager, Midland (Pa.) Works, Crucible Steel Co. of America.

P. G. Hughes, appointed sales manager, Westinghouse Electric Corp.'s Ordnance Dept., Baltimore, Md.

E. R. Campbell, appointed branch manager, Tampa, Fla. sales office, Reliance Electric & Engineering Co., Cleveland.

C. B. Tillson, Jr., named asst. manager, Fuel Div., Crucible Steel Co. of America, Pittsburgh.

W. K. Kise, Jr., appointed metallurgist, special alloys development group. The Carpenter Steel Co., Reading, Pa.



E. D. Vancil, elected vice president, The Cincinnati Milling Machine Co. and manager, Meta-Dynamics Div.



T. L. Hammond, elected chairman of the board, Whiting Corp., Harvey, Ill.

A. S. Rogers, appointed contracting manager, Trenton plant, American Bridge Div., U. S. Steel Corp., Trenton, N. J.; T. A. Dollins, Jr., named contracting manager in the Division's New York office.

H. T. Beatty, appointed manager, Light Metals Plant, Engineering Works Div., Dravo Corp.

R. E. Deshon, appointed general manager, Western Nipple Mfg. Co., Los Angeles.

L. L. Krause, appointed controller, Valvair Corp. and The Sinclair-Collins Valve Co.



W. R. Howell, appointed assistant to the vice president, operations, Crucible Steel Co. of America, Pittsburgh.

3 new applications get longer life and minimum maintenance using Dodge pillow blocks with Timken' bearings

Pictured below are three applications where Timken bearing equipped Dodge pillow blocks stay on the job with little attention under tough conditions. Their tapered design lets Timken® bearings take both radial and thrust loads in any combination. And full-line contact between rollers and races provides extra load-carrying capacity. Wear is reduced, maintenance is cut to the minimum.

Cutaway view shows the Dodge

All-Steel pillow block with Timken bearing mounting. Of special design, the bearing has a tapered bore with self-aligning spherical outer surface—never needs adjustment.

Besides the All-Steel pillow block, other versatile Dodge pillow blocks with Timken tapered roller bearings are: Type "E", Double-Interlock, Type "C" and Special Duty. All are compact in design. Special thrust devices that take up extra space are not needed.

So specify bearings trade-marked "TIMKEN" for the machines you buy or build. They bring Better-ness to any machine because Better-ness rolls on Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



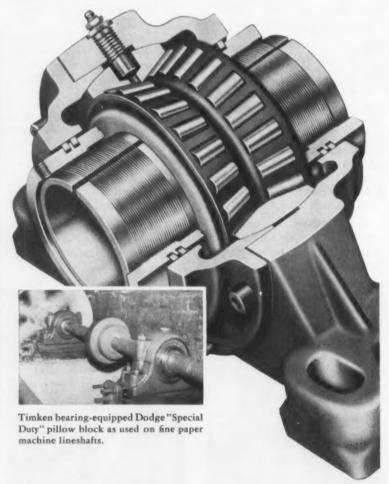
This symbol on a product means its bearings are the best.



Timken bearing-equipped Dodge All-Steel pillow block used in a vibrating conveyor.



Timken bearing-equipped Dodge Type "E" pillow block used in sand and gravel plant.



TIMKEN

TAPERED ROLLER BEARINGS ROLL THE LOAD



How
To Get More
For Your
Metalworking
Dollar

PLASTICS

IN THIS FEATURE

True, plastics and metals compete; but it's also a fact that they complement each other—that many advances of the past decade owe their existence to the two materials working together.

Today it's a rare product of metalworking that doesn't in some way use or come in contact with plastics. The hundreds of examples on the following pages are ample proof of this growing kinship.

They also point up the need to know more about these versatile materials—to evalu-

ate their properties and present uses in terms of your own products.

It may be that your chief interest lies in plastic-base coatings and finishes; or in plastic tooling to cut costs on a short-run forming job. And what about the design problems that metals alone won't solve?

Still another angle: idle machining capacity can be put to work on plastics as well as on metals. Find out now where you can make them serve you better, and how you can cash in on the plastics boom.

What Makes a Plastic?

The first encounter can be a bewildering experience.

Right off, there's a new language. Adding to the confusion are thousands of tradenames. and the materials they cover aren't necessarily plastic.

Here's how to make order out of this seeming chaos.

· Ask anyone but a plastics engineer to define "plastics" and its ten to one the answer will be only half right. Neither the resins, the base materials, nor the end product (with a few exceptions) are plastic in the dictionary sense.

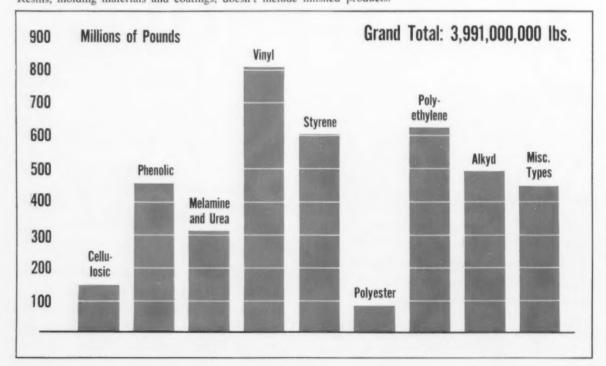
The full technical definition approved by ASTM, the Society of Plastics Engineers (SPE) and the Society of the Plastics Industry (SPI) is pretty specific: "Plastics are a large and varied group of materials which consist of or contain as an essential ingredient a substance of high molecular weight which, while solid in the finished state, at some stage in its manufacture is soft enough to be formed into various shapes-most usually through the application (either singly or together) of heat and pressure."

Most Are Synthetics-With the exception of the cellulosics, which are modified high polymers made from ordinary cotton, plastics do not occur naturally. Heat and pressure changes the basic ingredients from monomers (composed of single small molecules of carbon, hydrogen, nitrogen, and oxygen) into polymers (long-chain or giant molecules) which result in solid or semisolid structures. Copolymers stem from the polymerization of dissimilar monomers

Polymers, before they're processed into actual plastics, are called resins. They may be in a liquid state, as well as in the form of dry chunks, granules or powders. Resins are generally insoluble in water and must be mixed with alcohol or other solvents to form what is variously called a varnish or resin bath. For some plastics, dry powders may be molded or extruded without the addition of solvents or plasticizers.

Sales of Plastics in 1957

Resins, molding materials and coatings; doesn't include finished products.



Because of the almost endless combinations of materials available to the high-polymer chemist today, it is difficult to generalize about resins—each must be considered in the light of its specific composition and properties.

Two Main Types—All plastics can be classified under two main subdivisions — thermosetting and thermoplastic (with a gray area in between known as thermoelastic).

Thermosetting plastics are those that set or harden on heating and cannot be restored to their original form by remelting. Typical of these materials are the phenolics, epoxies, polyesters, melamines, and ureas.

Thermoplastics are softened by heat, but regain their original hardness on cooling. They can be reshaped over and over by alternate heating and cooling. This group includes the styrene polymers and copolymers, vinyls, acrylics, cellulosics, polyethelenes, nylons and fluorocarbons.

Together, the two classes com-



FAMILIAR TYPE: Nylon, a thermoplastic, comes in many different forms for easy processing into small parts such as gears, cams and bearings.

prise some of today's most versatile engineering materials. They provide an almost infinite variety of physical, thermal, chemical, and electrical properties. They also offer light weight combined with high strength, an array of built-in colors, are easy to machine and process by mass-production methods (molding, ex-

trusion, casting, fabrication from sheets, rods, and tubes), and combine well with other materials (wood, metals, fabrics, paper).

Moreover, plastics stem largely from cheap, abundant raw materials. As a result, the possible supply is virtually unlimited and their cost is relatively low.

■ How to Get More for Your Plastics Dollar Section 2

Where to Use Thermosetting Types

As a group, thermosetting plastics find wider industrial use than the thermoplastics.

Metalworking meets them most in the form of finishes, laminates, and plastic tooling.

 There are six major classes of thermosetting plastics—the caseins, epoxies, melamines, phenolics, polyesters, and ureas. Some of these, as well as sub-types within the main groups, are limited to rather specific uses; still, they have special properties which are solving more and more design problems every day.

Casein

Long referred to as the button plastic, casein plastics are made from the casein (coagulated protein) of cow's milk. Since formaldehyde is necessary to transform it into a usable plastic, the material is more properly called casein - formaldehyde. Plastics of this type have long been used for buttons, buckles and knitting needles; and more recently for such items as knife handles, pens, pencils, beads, game counters, and pushbuttons.

Casein-formaldehyde plastics have generally good impact strength and elasticity; they share most of the properties of other thermosetting plastics, but to a lesser degree.

Epoxies

These are the newest of the largevolume industrial plastics, and perhaps the most versatile. Originally valued for their adhesive qualities (they're widely used for joining both metals and nonmetals), their excellent physical, chemical and thermal traits have since led to hundreds of other applications.

Epoxies find wide use for potting or encapsulating electronic components; electrical insulation in corrosive service; impregnating and bonding laminated plastics; wear and corrosion-resistant paints and varnishes; plastic tooling (in the form of casting resins) for making metal-forming tools, fixtures, foundry patterns, vacuum forming dies and the like; lightweight ducts and piping for chemical plants; radomes, aircraft skins, honeycomb sandwich structures; pressure vessels for gases and liquids; rocket and missile parts; automobile adhesives and body-patching compounds; cements and mortars, and even dental repairs.

Solid or Liquid—Epoxies come in either of two forms—solid resins, which are modified with other resins to make surface coatings having excellent adhesion; and liquid resins, which are hardened by amines or acids to make adhesives, castings, and plastic tooling compounds.

Surface coatings are made from

epoxy-phenolics and epoxy-ureas, epoxy-esters, and epoxy-polyamines. Each family has different characteristics—the first having high hardness and chemical resistance, the second being more adaptable to paints and varnishes, and the third combining the best features of both.

Most of the liquid resins used for casting are cured (hardened to final form) without heat or pressure; toughness and flexibility can be increased by blending with polyamides or polysulfides, which give amber or opaque castings.

Melamines

Melamines, which together with urea - formaldyhydes comprise the group known as amino resins or aminoplastics, find many important industrial and military uses.

They make shock-resistant laminates for naval craft; critical military, aircraft and missile structures; parts for industrial and household appliances; high-grade unbreakable dinnerware and tableware; cutlery handles; boilproof adhesives; leather tanning and textile processing compounds; and are used in wet-strength paper, high-gloss, mar-resistant enamels, plaster reinforcement, and boil-resistant buttons and fasteners.

Vary at Will—Addition of fillers gives melamine molding compounds a broad range of physical and chemical properties. For example, wood flour is used in general-purpose molding compounds for auto ignition compounds, industrial connectors, and metering connection blocks, where high dielectric strength and arc resistance are important.

Heat-resistant molding compounds are made by adding mineral fillers such as asbestos; they'll withstand up to 400°F. Shock-resistance can be built in by adding cotton fabric fillers. And dyes or pigments gives bright, long-lasting colors.

Melamine resins are also used in laminates where good impact strength, low water absorption, high arc resistance and good heat resistance are required—and for decorative uses such as tabletops, panels, and displays.

FORMS METAL: Production die for forming aluminum tubing is made of reinforced epoxy tooling compound.



General Properties of			Melamines	Poly	vesters	
			(alpha C	ast, unfilled, I	Molding compound,	
Thermosetting Plastics	Casein	Epoxies	cellulose filler)	rigid	mineral filled	Phenolics
Specific gravity	1.35	1,11-1,23	1,47-1,52	1,10-1,46	1.80-2.25	1.32-1.45
Strength, 1000 psi					***************************************	
Tensile	10	4-13	7-13	6-10	3-4	6.5-8.5
Compressive	27-53	15-18	25-43	13-36.5	18-25	27-36
Flexural	10-18	14-19	10-16	8.5-18.3	7.5-10	8.5-12
Elongation, pct		0-10	0.6-0.9	5.0		0.4-0.8
Impact strength, Ized	1.5	0.2-0.45	0.24-0.35	0.2-0.4	0.30-0.35	0.24-0.60
Thermal expansion, linear, 10 ⁻⁵ /°C	4.1-6.8	4.5-6.5	4.0	5.5-10	3.5	3.0-4.5
Heat resistance, °F continuous	275	250-600	210	250	300-350	300-350
Distortion temperature, °F	300	115-550	400	140-400	350-425	260-340
Dielectric strength, v per mil	400 (dry)	400-500	300-400	380-500	350-450	200-425
Dielectric constant, 106 cycles/sec.		3.3-4.0	7.2-8.2	2.8-4.5	4.6-5.5	4.2-4.6
Power dissipation factor, 10 ⁶ cycles/sec.		0.030-0.050	0.027-0.045	0.006-0.026	0.015-0.04	0.03-0.07
Arc resistance, seconds		45-120	110-180	125	75-190	tracks
Water absorption, 1/8-in. thick, pct in 24 hr	7-14	0.08-0.13	0.1-0.6	0.15-0.60	0.15-0.8	0.3-1.0
Chemical resistance*						
Weak acids	P	G	E	F	E	G
Strong acids	P	G	P	P	E	F
Weak alkalis	P	E	E	F	P	G
Strong alkalis	P	E	P	р	Р	P
Machining qualities*	G	G	F to G	G	F	F to G
*E - excellent, G - good, F - fair	_	-	. 10 0	-		1 10 0

Phenolics

Still known as the workhorse of the plastics industry, phenolics are easily the most popular and inexpensive of the industrial thermosetting plastics. They have nearly every desirable trait for thousands of different uses, including telephone hand-sets, radio-tube bases, TV housings, washing - machine agitators, tooling and forming dies, industrial castings, and electrical grades of laminated plastics.

Phenolics (actually phenol-formal-dehydes) have excellent chemical, electrical, water and heat resistance—in fact, most of the very high heat-resistant laminates used in rockets and missiles today are phenolic laminates. The chief drawback is their limited color range—black, brown, and various shades of walnut, with black predominating.

Phenolic resins are either solid or liquid. For molding, they are purchased in powder form and usually mixed with fillers, lubricants and pigments. For shell molds in foundry work, both solid and liquid forms can be used.

Liquid phenolic resin is an alcohol solution used for coating paper, cloth, and glass-fabric bases in the laminated plastics industry. Recently, foamed phenolics have become available for special insulation problems.

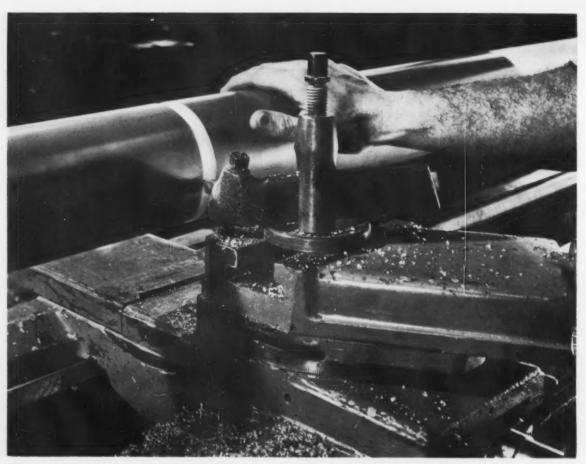
Broad Range of Fillers—Phenolic molding compounds are available in granular, nodular, and macerated forms, each of which can be mixed with a variety of filler materials to give almost any desired combination of physical, chemical, and electrical properties — wood flour, cotton or nylon flock, macerated rag, asbestos fiber, mica, sisal, glass, and others. Phenolic laminates can also be macerated and molded, or molded in the form of laminated rods, tubes, and special shapes.

About 6 pct of 1957 phenolic resin output was used for protective coatings, and 10 pct of the total went to the plywood industry in the form of adhesives.

Cast phenolics are the least costly of the casting resins in wide use to-day; lead or plaster-of-paris molds — also inexpensive — can be used very nicely with liquid phenolics.

Phenol - furfural and resorcinolformaldehyde plastics are similar to phenol-formaldehydes. Furfural imparts a longer flow characteristic to the phenolics where this is required in certain molding operations, as in the manufacture of TV cabinets. Phenol-furfurals are also used in brake linings, radio speaker diaphragms, grinding wheels, handles, pulleys, dials, and knobs.

Resorcinol-formaldehyde is used primarily as a room-temperaturesetting adhesive in laminated gear blanks, laminated wood frame mem-



MACHINES EASILY: Large laminated-plastic tube is turned on a standard high-speed metalworking lathe.

bers for ships, and for other outdoor applications.

Polyesters

This group, which for practical purposes can include the alkyd resins, is widely used in making low-pressure reinforced plastics, high-pressure laminates, preform and premix molded parts, and industrial and decorative castings.

Polyesters are easily handled and cure rapidly. They develop good to excellent physical, chemical and electrical properties that can be varied by using different fillers. Typical uses today include structural parts for electrical equipment, refrigerator parts, automobile heater and air-conditioner parts, automobile window frames, and washingmachine tubs.

Architectural sheet and panels

are one of the major outlets for polyesters because of their good weathering qualities, high translucency and strength. Skylights, awnings, and industrial glazing (often reinforced with aluminum or steel mesh) are among the principal forms.

Reinforced with glass fiber or cloth, polyesters are used to make plastic boats and auto bodies, radomes up to 36 ft long, and large storage tanks for corrosive liquids such as electroplating baths. There's also a growing trend toward use of reinforced polyesters in housings, belt guards and the like on machine tools.

Polyurethanes, or foaming plastics, are a specialized form of polyester and isocyanate.

Alkyd resins are widely used in the paint and varnish industry, being adaptable to many air-drying and baking organic finishes for wood, metal, plaster, paper, and plastics themselves. And they are low in cost.

Ureas

Like the melamines, the ureaformaldehydes are aminoplastics, and their properties are very similar to those of the melamines. They're available in the form of molding compounds, adhesives, textile ressins, paper resins, and surface coatings.

Ureas have proved popular as adhesives in the plywood and furniture industries, in the manufacture of wrinkleproof cotton or rayon fabrics, in baking enamels, buttons, light reflectors, radio cabinets, stove hardware and many other products. They are not well suited to outdoor applications involving weathering and high humidity.

What the Thermoplastics Offer

These are the big guns of the plastics industry, the volume materials that show up most in the vast consumer field.

Paradoxically, they're cutting into some of the mass markets formerly enjoyed only by metals at the same time they help make some of metalworking's products better.

• The other large group of plastic materials, the thermoplastics, includes acrylics, cellulosics, flurocarbons, nylons, polyethylene, polypropylene, polystyrene, and vinyls. In general, the thermoplastics are numerically and economically more important than the thermosetting plastics.

Acrylics

These are the highly transparent, sometimes crystal-clear, cast sheets and molded parts made of methyl methacrylate.

Transparency is perhaps their greatest asset, but resistance to both sunlight and weathering runs a very close second. The acrylics also offer high impact strength, good formability, resistance to most chemicals, low water absorption, low specific gravity (light weight), high dielectric strength, and good shock resistance.

Seen Everywhere-Familiar applications are airplane windows. windshields, and bubble canopies; laminated automobile windshields; instrument panels, radar plotting boards, outdoor signs and lettering,

TAKES MANY FORMS: Versatile nylon can be molded, machined, cast and extruded into a variety of shapes. It also makes coatings.

THE IRON AGE, June 26, 1958

display fixtures and cases, industrial window glazing, safety shields, inspection windows, machine covers, pump components, dome skylights, lighting fixtures, shower enclosures, automobile taillight and stoplight lenses, medallions, nameplates, dials, hairbrush and toothbrush backs, contact lenses, transparent demonstration models, decorative table tops and lamp bases.

Acrylic fibers such as Orlon and Acrilon have strong resistance to acids, mildew, fungus, most solvents, and fire. Acrylics are also used in leather-finishing applications, emulsion paints, lacquer coatings, automotive finishes, upholstery fabric, and soil stabilization. In addition to cast sheets, acrylics are available in the form of molding powder for injection



and compression molding and for extrusion.

Cellulosics

This group includes the first plastic material, Celluloid, a form of cellulose nitrate (collodion) invented in 1869. Cellulose nitrate is the toughest of all the thermoplastics; but it's also very inflammable, which limits its usefulness.

Cellulose acetate is very tough and can have built-in flame resistance combined with high impact strength, good electrical resistance, excellent coloration as well as good transparency. Applications are mainly for toys, beads, cutlery handles, electrical parts, packaging material, electric insulation, and tape.

Cellulose acetate butyrate is more compatible with solvents and plasticizers than cellulose acetate, and requires less pressure in molding operations. Like other cellulosics, it is extremely tough, has high impact strength, light weight, low moisture absorption, good dielectric strength, and is readily colored in addition to being highly transparent. It is easily machined with ordinary tools.

Also Versatile — Applications include plastic pipe for water and gas lines, electrical conduit for telephone and power circuits, insulation tape, waterproof finishes for paper and fabrics, protective coatings on metal tools and parts, chipproof coatings for metal surfaces, and indoor and outdoor signs.

Cellulose propionate, excellent for injection-molding and extrusion, has greater resistance to weather than cellulose acetate, plus high toughness and shock resistance. It is used for automotive parts, pens and pencils, toys, radio and television parts, toothbrushes and hairbrushes, eyeglass frames, shatterproof portable radio cases, and outdoor signs.

Cellophane, made from hydrated or regenerated cellulose, is the most widely available and least expensive plastic film. It has good electrical properties and oil resistance.

Nylons

The term nylon refers not to a single product but to a family of related products which have slightly dissimilar properties. They are polymeric amides (polyamides) with a protein-like structure.

Apart from its use in textiles, nylon is a familiar material for gears, slide fasteners, water tumblers, faucet washers, fishing line, rope, brush backs and bristles, various containers, bearings and bushings, intricate moldings, lightweight bolts and nuts, leakproof check valves, clutch facings, and unbreakable transistor-radio cases.

Strength With Resilience — Nylons are tough and resilient, with high tensile, impact, and flexural strengths, abrasion-resistant surfaces, low coefficient of friction, and good chemical and thermal resistance. They can be accurately molded into intricate shapes.

Gears, bearings and other moving parts of molded nylon need little or no lubrication under many service conditions and frequently outwear metal.

Nylon's chemical resistance is valuable where electrolytic action would corrode metal. It's now available in extruded tubing, pipe, film and sheeting—the tubing for chemical fluids and pressure-lubricating systems.

Products in which nylon is being used are legion. They include household appliances, calculating machines, automobile speedometers, windshied wipers, builder's hardware, sliding tracks for storm windows, door-closing mechanisms, mixer valves for automatic washing machines, switch housings, grommets, cable clamps, insulation for wire and cable, marine equipment. fastening devices, sporting goods, films and laminates, fuel lines, sterilizable packages, soft-faced hammers, bowling-pin bases, linings for fuel cells, and finishes.

Polyethylenes

The second largest and fastest growing of all plastic materials, polyethylene is a serious contender

PLASTIC PROTOTYPE: Hope Machine Co. first makes new valve designs of transparent acrylic to observe operation, spot possible flaws.



General Properties of Thermoplastics

	Acrylics	Cellulosics	Fluerocarbons	Nylons	Polyethylenes	Polypropylenes	Polystyrenes	Silicones
Specific gravity	1.17-1.20	1.24-1.34	2.1-2.2	1.09-1.14	0.910-0.965	0.90-0.91	0.98-1.11	1.6-1.9
Strength, 1000 psi								
Tensile	7-9	1.9-8.5	6.5-9 (70 °F)	7-10.9	1.5-5.5	4.3-5.7	3.5-12	4-5
Compressive	12-18	13-36	0.6	7.2-13	2.5	8.5-10	4.8-16	9-15
Flexural				8-13.8	1.4-7	114-170	5-17	9-14
Impact strength, Izod		0.4-5.2		1.0	0.5-16.0	19	0.2-11.0	3-15
Elongation, pct			20-60 (70 °F)		15-1000	10-20	1.0-90	
Dielectric strength, v per mil	450-550	250-365	400-500	385-470		75-80		125-300
Heat resistance, "F continuous	140-190	140-220		270-300	212-250	302	140-205	480
Heat distortion, °F	160-195	110-205	250 (@ 66 psl)	300-360		284		500-900
Water absorption, pct in 24 hr	0.3-0.4	1.9-6.5	0.005	0.4-1.5		nil	0.03-0.55	
Chemical resistance*	G to E	F to P	E	G to E	E	E	E to P	F to E
Machining qualities*	E	G	E	E	F to E	E	F to G	G

for wastebaskets, garbage cans, 22-gal drums, water pipe, squeeze tubes, molded containers, pouring spouts, funnels and other items formerly dominated by metals.

It comes in two types: the conventional high-pressure, low-density polyethylenes, and a fairly new lowpressure, high-density material.

Polyethylene in film form needs little description; almost everyone is familiar with the characteristic "waxy" feel and extreme flexibility of the inexpensive, low-density type. The high-density materials are stronger, stiffer, less ductile, more heat resistant, and less permeable.

Big Volume in Film — Since 1953, more than a third of all polyethylene used in the U. S. has been in the form of film, over 80 pct of which goes into packaging of chemicals, foods, toys, textiles, hardware, and machinery parts. Another 15 pct of polyethylene goes into electrical insulation for power cables, telephone lines, TV lead-in wire, and household electric extension cords.

All forms of polyethylene can be readily injection molded from pellet form. One big advantage of molded polyethylene is its unbreakable quality.

Polyethylene coatings are used to waterproof fabrics, aluminum foil, milk containers and other materials.

Polypropylenes

A brand - new thermoplastic, polypropylene has long been mentioned as a serious competitor of polyethylene. At the present-time it's produced mainly in Italy, but a number of U. S. firms are ready to start volume production.

Actually, polypropylene is but one member of a whole new family of plastics called isotactic polymers, made with the help of stereospecific catalysts. They have high heat resistance (melting range is from 325 to 340°F), higher tensile strengths and rigidity than high-density polyethylene, Rockwell hardness between R85 and R95, excellent chemical resistance, and are unusually adaptable to compression or injection molding, extrusion, and coloring.

These so-called tailor-made plastics fit into a wide range of applications from pipe, pipe fittings and valves to packaging films, heat-sterilizable bottles, cable insulation, battery boxes, refrigerator parts, toys, radio cabinets, buckets, basins, textile machinery parts,

impellers and casings for centrifugal pumps, automobile steering wheels, and sheets for vacuum and pressure forming.

Polystyrenes

Styrene polymers, or polystyrenes, are the third most popular plastic in use today—mainly for toys, radio housings, refrigerator food containers, battery cases, emblems, signs, displays, disposable packagings.

The biggest drawback of standard polystyrenes is extreme brittleness. Other shortcomings are low heat resistance, crazing when used with metal inserts, and low abrasive resistance. On the plus side is their low cost, outstanding adaptability to high-speed automatic injection molding, sharply defined detail, very high dielectric strength and good machining qualities.

Glass-reinforced polystyrenes have higher heat resistance and superior dimensional stability, are used for tape reels, blower wheels and textile bobbins. The newer impact-type polystyrenes have increased shock resistance and toughness, but somewhat lower heat resistance. These rubber-modified styrenes can

be punched, drilled, and molded around metal inserts without the precautions required by older types.

Polyurethanes

Also called isocyanate resins, polyurethanes are for purposes of this article mainly foam-producing plastics. The foams, which are rigid, semirigid or flexible, are commonly termed urethane foams.

Flexible foams have obvious uses in cushions, upholstery, padding, and rug underlay; rigid and semi-rigid foams are used in aircraft radomes, ailerons and rudders, and for making boats and pantoons nonsinkable. All three are flame-and tear-resistant.

A big feature of the urethanes is the fact that they can be foamed in place without heat or pressure. Also, they bond tightly to almost any material against which they're foamed, and furnish considerable support. This makes them ideal for sandwich constructions, and low-temperature insulation or sound-

proofing of compound cavities and complex shapes.

Fluorocarbons

These plastics are completely inert to nearly all chemicals and solvents normally encountered in industry (except metallic sodium and other alkali metals), as well as being fully impervious to water. They are tough, resilient, impactresistant, weather-resistant, heat resistant (up to 525°F), and have a very low coefficient of friction—actually, they're self-lubricating.

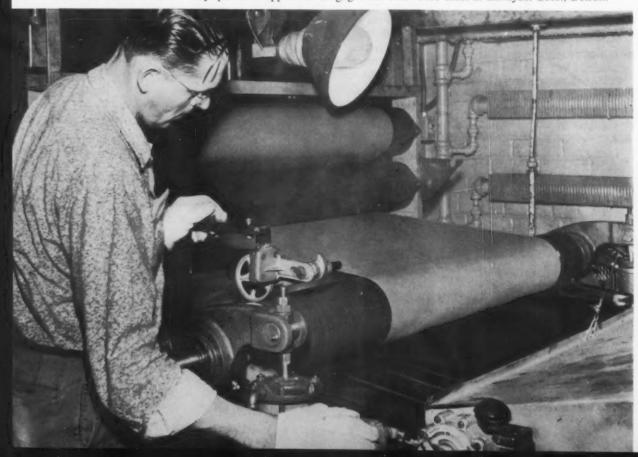
Fluorocarbon resins are supplied as molding powders, extrusion powders (which are compounded with an organic extrusion aid) and in aqueous dispersions. When fabricated into tape, sheets, rods, cylinders, wire and fabric coatings. laminates, or various unsupported parts, the material has a milky, waxy appearance and slippery feel.

Applications cover a broad range: gaskets, packings, valve seats, discs and specially fabricated pump and mixer components; hose lining for jet engines; piston rings, seals and lockwashers for power-steering mechanisms; c h e m i c a l plant piping; impregnating resins for laminated plastics (usually with glass-fabric filler); flexible printed circuitry; electrical insulation (high dielectric strength with zero moisture absorption); water-meter pistons; heat and acid-resistant seals.

Processing Differs—Because the fluorocarbons don't melt and flow they have to be formed by a compression-molding method in which the material is first cold-formed, then sintered at high temperatures. Extrusion techniques for rods, bars and tubing have been developed in which forming and subsequent sintering are done as consecutive stages in the same operation.

Thin sections of fluorocarbon plastic may be made by a new process in which a lubricated paste of the resin is extruded. Tape is made by calendering, or by skiving

VINYL-CLAD STEEL: Vinyl plastic is applied to 22-gage J&L cold rolled sheet at Shwayder Bros., Detroit.



sheet from molded cylinders and then slitting it. All forms may be colored by adding pigment to the powders before forming.

Fluorocarbons in the form of dispersions can be made to adhere to metal after fusion of the particles by baking at temperatures above the transition point of about 620°F. They can also be copper-clad without a resin adhesive.

Vinyls

First in volume of plastics sales, the vinyls are a household item in every sense of the word. They're used in shower curtains, raincoats, phonograph records, floor tile, inflatable swimming tubes and floats, wading pools, lamp shades, table mats, upholstery, vapor barriers, silo covers, safety-glass sandwiches, flash bulb linings, toys, work gloves, shoe soles, screening, garden hose, yard goods, nursery goods, table covers, appliance and furniture covers, sportswear, aprons, wall coverings and many others.

The vinyl family at present consists of eight commercial plastics: polyvinyl acetal; polyvinyl acetate; polyvinyl alcohol; polyvinyl butyral; polyvinyl carbazole; polyvinyl chloride; polyvinyl chloride-acetate; polyvinylidene chloride. Of these, polyvinyl chloride has the largest total sales of any single plastic.

In the metalworking field, vinyls are of interest chiefly as decorative and protective coatings. Methods have been developed for continuously coating sheet and strip right at the steel mill, as well as for spotwelding precoated metal after

forming (without affecting the vinyl film).

Silicones

The silicones are a relatively new group of semi-organic polymers having extreme resistance to low and high temperatures. Other attributes are very high dielectric strength, excellent moisture resistance and dimensional stability. They can be foamed in place to produce lightweight rigid structures, or made into foamed blocks.

As electrical insulation tapes or coatings, silicones provide protection at temperatures as high as 350°F, where ordinary insulation materials would melt and flow. Silicone resins are used to impregnate glass fiber to make a heat-resistant, high-dielectric laminate.

• How to Get More for Your Plastics Dollar | Section 4

How Plastics Are Processed

In lots of ways, working with plastics is much like working with metals.

They machine easily at high speeds and feeds on essentially the same equipment.

Even molding methods aren't too different in principle from diecasting and many foundry techniques.

 Since plastics differ widely in chemical composition, properties, and end uses, it's to be expected that they differ also in methods of manufacture.

Before actual processing can start, various chemical additives and reinforcing materials must be added to produce the desired properties both for manufacturing and for end use. Most basic resins are combined or compounded with various plasticizers, stabilizers, coloring agents, fillers, catalysts, and solvents

The major means of processing are molding, casting, extrusion, coating, calendering, sheet forming, high-pressure laminating, low-pressure laminating, postforming, machining, and finishing. There are at least six methods of molding, injection and compression being the two foremost.

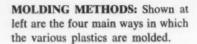
Injection Molding—This is the main method of forming thermoplastics. Plastic material is placed in a hopper feeding into a heating chamber. A plunger pushes the plastic through this chamber, where the material is softened to a fluid state. Next, the fluid plastic is forced at high pressure through a nozzle into a cold mold, which opens when the plastic has cooled to a solid state; the finished piece is then ejected from the press.

Thermosetting materials can be injection molded by a variation of the process known as jet molding in which the plastic is liquified just as it goes through the injection nozzle into the mold, but not before. The jet is a special small-aperature nozzle heatd to 1000°F; it's insulated so heat doesn't flow to the chamber behind it.

Compression Molding—The principal method of forming thermosetting materials, this is simply a squeezing of the material into the desired shape by applying heat and pressure in a mold.

Plastic molding powder (preheated in most cases), mixed with suitable fillers is placed directly in the open mold cavity. The mold is then closed, pressing down on the plastic and causing it to flow. While in the closed mold the thermosetting material undergoes a





chemical change that permanently hardens it into the desired shape.

Pressure, temperature, and time vary with type of resin and dimensions of the finished product.

Transfer molding — An adaptation of compression molding, this method is used for intricate parts with small, deep holes or numerous metal inserts. Heat and pressure are applied to the dry molding compound in a separate chamber, before actual molding, to render it fluid; then it's forced through a series of channels into the mold cavity so that if flows around pins (that form the holes) and metal inserts without making them shift position.

Solvent Molding—Solvent molding, also called shell or slush molding, is used for thermoplastics. It makes use of the fact that when a form or mold is immersed in (or filled with) a plastic solution, a layer of the plastic film adheres to the sides. Repeated dippings or fillings give the desired film thickness.

Blow Molding—Used for thermoplastics, blow molding consists of stretching and then hardening the plastic against a female mold. In the direct method a gob of molten material is formed into the rough shape of the finished product, then inserted in the mold and blown up with air, which forces it against the sides of the mold; then it's cooled (hardened) and removed.

In the indirect method, a thermoplastic sheet is heated, then clamped between a die and cover; air forced between the plastic and cover forces the material into contact with the die.

Casting — The main difference between molding and casting is that the latter requires no pressure.

The plastic (thermosetting or thermoplastic) is heated to a fluid







THE IRON AGE, June 26, 1958

OTHER TECHNIQUES: Extrusion is used for tubes and rods; calendering can also apply coatings.

state, then poured into either open or closed molds, cured at the required temperature, and removed from the mold. Casting of film and sheets is usually done on a wheel or belt (from which they are later stripped), or by chemical precipitation.

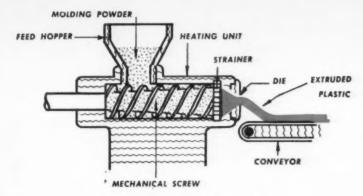
Extrusion—Also called extrusion molding, it's used to form thermoplastic materials into continuous tubes, rods, film and sheets.

The process starts with dry plastic powder or granules in a hopper, from which they are screw-fed through a long heating chamber. At the end of the chamber molten plastic is extruded through a small opening or die which imparts the desired shape. From the die it is fed onto a conveyor belt for cooling, either by blowers or by immersion in water.

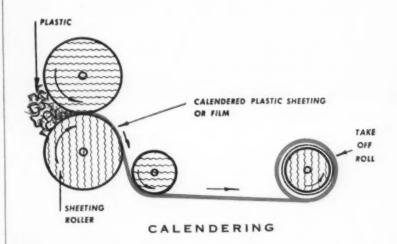
Wire and cable coatings are extruded around a continuing length of wire which also passes through the extruder die. Or the tubing may be inflated as it comes from the die to prevent collapse before the plastic has cooled and hardened. Film or sheet is extruded in tube form, then split, stretched and thinned to required dimensions.

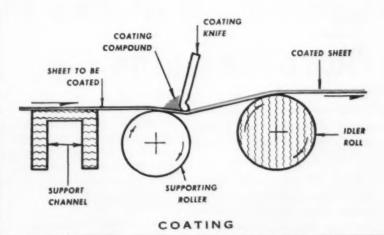
Coatings — Both thermosetting and thermoplastic materials may be applied as coatings on metal, wood, paper, fabric, glass, leather, concrete, ceramics, or on other plastics. Coating methods include knife or spread coating, spraying, roller coating, dipping, and brushing.

In spread coating, the base material passes over a roller and under a long blade or knife, in front of which the plastic is placed and thus spread evenly over the material. Roller coating involves two horizontal rollers, one to pick up the plastic solution and the second to deposit it on the base material. Coatings may also be applied by spray gun or brushing, as in silk-



EXTRUSION MOLDING





screen work, or by dipping and drying.

Calendering—This is also a form of coating, but mainly for making vinyls and similar thermoplastics into film and sheeting.

The plastic compound is passed

between a series of three or four heated rollers, which squeeze the material between them into a sheet or film. Thickness is controlled by the space between the rollers, and the finish (matte or smooth) by roller surfacing.



HAND LAYUP: Boats, tanks and the like are made by draping the mold with fabric, then applying resin.

• How to Get More for Your Plastics Dollar | Section 5

Laminating Makes Plastics More Versatile

Impregnating and laminating paper, cloth, fibers or metals with plastics creates a whole new family of materials.

High strength, light weight and resistance to heat and corrosion make them candidates for many jobs that even metals can't handle.

· Plastic laminates, or laminated plastics, are rigid sheets, rods and tubes made by impregnating base or filler materials with thermosetting resins and fusing them together by heat and pressure.

The pressure required (above or

below 1000 psi) has been used as a dividing line between the high-pressure laminates and the reinforced plastics or low-pressure laminates. Actually, however, low-pressure laminates are encroaching on the dividing-line pressures.

High-Pressure Laminates

The most widely used resins in the high-pressure laminating field are the phenolics. Melamines, epoxies, fluorocarbons, polyesters, and silicones are increasingly used.

Besides the choice of resin, the properties of the finished laminate

depend on the type of base or filler material. These range from various grades of paper (kraft, alpha-cellulose, rag) to synthetic and natural fibers, either matted (felted) or woven into fabric, as well as asbestos, nylon, and glass.

Complex forms can be laminatemolded in specially designed molds to save on machining. Laminated sheets can also be chopped up (macerated) into small squares or flakes 1/8 to 1/2 in. square, which are placed in a mold and cured under pressure as in powder molding.

Combination Laminates - Laminated plastics can be combined with

metals and other nonmetals to produce a combination material with the best properties of each. Some of the possibilities include copper, aluminum, steel, rubber, acetate or polyester film, synthetic rubber, vulcanized fiber and cork. Strengthweight ratios can be improved, abrasion and corrosion resistance increased, and electrical characteristics, including high conductivity, added.

Laminated plastics bonded to airplane shock-strut pistons eliminate metal-to-metal contact that might cause seizure; backed with aluminum, they produce stronger ball bearing retainers; applied to steel mill rolls and conveyor rollers they add chemical resistance, lower abrasive action, and electrical insulation.

Growth of printed circuitry is largely due to development of copper-clad laminates. These are a combination of paper- or glass-base phenolic, epoxy, or fluorocarbon-impregnated laminate and electrolytic copper on which the desired circuit is photoengraved or silk-screen printed, then etched to remove unwanted copper. The remaining copper circuit may be plated with gold, silver, nickel or rhodium to increase wear and chemical resistance and improve solder-ability.

Postforming — While laminates use only thermosetting resins, they'll soften enough on reheating to permit postforming at elevated temperatures. Special grades of fabric that stretch without tearing are used. Channel-shaped pieces that can be formed by simple bending are the easiest to make; box or domeshaped pieces require drawing and forming much in the same way that sheet metal is deep-drawn.

Easily Machined — Laminated plastics are readily machined on standard metal and woodworking machinery. They have lower shear

MAIN METHODS: Low-pressure laminates are made either by reinforcing or by variations of the bag method with male or female molds. strength, which permits high cutting speeds and feeds. But they require tools that can remove chips faster; drills with wider, smoother flutes; sharper cutting edges; and either air, mist, or liquid coolant to control heat due to their poor thermal conductivity (for specific details see "How to Machine Laminated Plastics," The IRON AGE, May 1, 8 and 15, 1958).

Many Uses—Industrial applications for high-pressure laminates include gears, rotor vanes, pump bearings, cams, switch parts, aircraft and electronic components, instrument panels, circuit-breaker arc chutes, pipe flanges, valve plates, piston rings, valve disks, bolts, set screws, slot wedges, liners, spacer blocks, terminal panels, nameplates, dial faces, switch covers and boxes, guards, and formed plates.

Certain types of laminates have

tensile strengths of 90,000 psi.

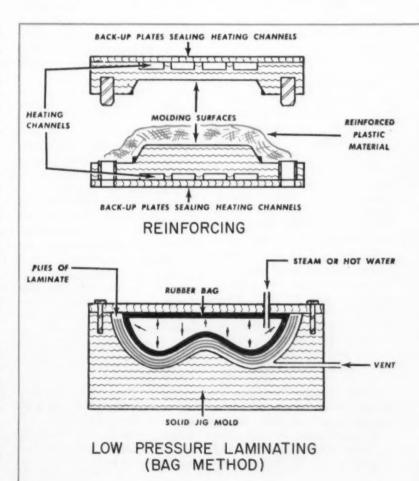
Phenolic - impregnated felted asbestos laminates will withstand up to 3000°F for structural applications in jet aircraft and guided missiles, and even higher temperatures over short periods of time.

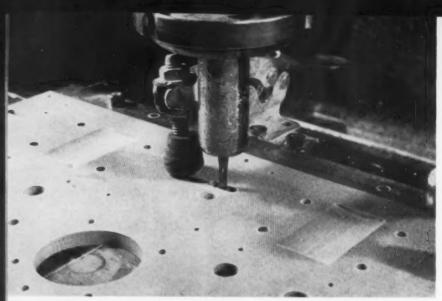
Low-Pressure Laminates

Polyesters are the most common low-pressure laminating resin, but epoxies, despite their higher cost, are coming into wider use.

Boat construction is one of the largest fields for low-pressure laminates; polyester resin reinforced with glass fiber accounts for almost 20 pct of the total outboard boat market — about 60,000 units. A good bit also goes into the automotive and truck industry.

Reinforcing materials for lowpressure laminate may be in sheet





MACHINING LAMINATES: Just like wood or metal, this sheet laminate undergoes drilling, slotting, flycutting and contour milling.

or mat form, depending on desired qualities. Impregnated material is cut to fit the shape of the finished product (either one-piece or sectional). Enough material is placed on a male mold to give final thickness and form; then molding is completed in heated female dies.

Eliminates Matched Molds — In the bag molding process, a single mold is used; reinforcing material is laid up on a male mold, inserted in a rubber bag from which all air is withdrawn to press it around the lay-up, and cured in an oven. If a female mold is used, a diaphragm is placed over the mold and air withdrawn as before; this draws the diaphragm down inside the mold to press the fabric against it.

Recently a new process called sprayup has been introduced. It involves a triple gun that ejects a stream of resin and glass which adheres to any surface it strikes. Sprayup requires only about one-fourth the direct labor of hand layup and produces laminates of excellent stiffness and strength.

Plastic Tooling—The biggest industrial use of low-pressure or reinforced laminates is plastic tooling —the manufacture of tools from epoxy-impregnated glass fiber. The process is used for metal-forming tools (stretch dies, draw dies, rubber press forms, drop-hammer dies); holding fixtures, gages, foundry tools (patterns, core boxes, core driers, core prints, match plates); prototype production tools (hand - hammer forms and other tools to establish die design); and plastic forming tools.

Advantages include time and cost savings; reduced lead time (plastic tools are made in a matter of hours or days); elimination of finishing (they're cast or laminated against the original model); quick design changes (dies can be revised by recasting, refacing, chipping off or adding plastic material); easy handling (lightweight, easily stored); and no corrosion or rust problems.

Tools and equipment required are simple and inexpensive; a surface plate, grinding wheel, band saw, metal cutters, file, spray gun, paint brush and straight edge. Woven glass cloth about 0.013 in. thick made of filaments 0.00023 to 0.00075 in. diam in strands of 204 filaments gives optimum physical properties.

How It's Done—A wood or plaster model, free of holes, scratches or soil, is first sprayed with clear lacquer, waxed and thoroughly rubbed. Successive layers of glass cloth, tailored to fit the form, are

draped and fitted in place dry, then removed.

Before actual laminating begins, a surface-coat epoxy is applied directly to the face of the model and allowed to dry; then the first layer of glass cloth is draped over the model and saturated with a laminating-grade resin. The cloth is smoothed and pressed by hand or spatula until trapped air is worked out. Then another layer of glass cloth is added, saturated with resin, and smoothed out—the procedure being repeated until a thickness of 3/16 to ½ in. is reached.

After drying and hardening, excess cloth is trimmed from the form with shears, saw, or disk sander.

Plastic tools may also be made by casting techniques, in which the liquid plastic resin is poured into a preformed cavity, cooled and dried.

Casting is recommended for draw dies, stretch press dies, hydroform dies, polyester lay-up molds, drop hammer dies, and foundry applications; the laminating process is used for jigs and fixtures, master and duplicate model forming, vacuum forming dies and routing fixtures.

Acknowledgments - The following firms helped make this special feature possible: Bakelite Co., Columbus Coated Fabrics Corp., Continental-Diamond Fibre Corp., Dow Corning Corp., E. I. du Pont de Nemours & Co. (Inc.), Eastman Chemical Products, Inc., General Electric Co., Loven Chemical of California, The Marblette Corp., Minnesota Mining & Mfg. Co., Montecatini of Italy, National Vulcanized Fibre Co., Polymer Corp. of Pa., Rohm & Haas Co., The Society of the Plastics Industry, Spaulding Fibre Co., Spencer Chemical Co., Synthane Corp., and Taylor Fibre Co.

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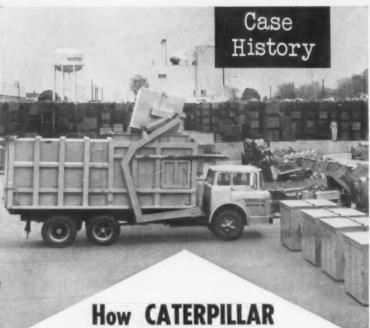
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TECHNICAL BRIEFS

Machining

Standard machine drills many holes in a few passes.

Adapting a standard machine to a special purpose, a diesel engine maker finish-bores 48 holes in four passes on a large cast iron cylinder head. The equally spaced holes are for valve seats, insert seats and valve guide bushings.

Using a standard Heald borer with a six-spindle cluster head and hydraulically-operated vertical indexing fixture, Cummins Engine



Using a six-spindle cluster head, the unit bores 48 holes.

Co., Columbus, Ind., finish bores and faces all 48 holes in four operations at a single chucking.

Near Six An Hour—Stock removal is 0.015 in. in the bore, 0.025 in. in the seats. Production is 5.4 pieces per hour at 70 pct efficiency. This is the operating sequence: With work hand-clamped in the angle plate fixture, cross slide in forward position and vertical slide in lower position, the table moves left at rapid traverse and slows down to bore, counterbore and plunge face.

The table then moves out to rest; six holes in the upper bank are finished. The cross slide indexes to the rear and the cycle repeats, completing 12 upper holes.

Cycle Repeats—The verticle slide then raises to the upper position. This brings the lower bank of holes in line with the boringheads. The cycle repeats—once with the cross slide at the rear and again with the cross slide forward.

The table is interlocked so it will not go "in" unless both slides are properly indexed. This provides a factor of safety for the machine, which is produced by Heald Machine Co., Worcester, Mass.

Welding

New process arc welds steel at 300-ipm

Using a new type flux-containing coiled wire electrode, a new process arc welds steel at 300-ipm rates. The electrode produces a vapor shielding for the open arc. This contrasts with the completely flux-covered arc of submerged arc welding and the open arc gaseous shielding of coated manual electrodes.

A development of Lincoln Electric Co., Cleveland, the new process doesn't require fluxing or shielding agents added to the arc



The process welds light gages (16 gage to ½ in.) with ease.

from external sources. All materials are integrally contained in the electrode.

Speeds in 14-gage lap welds in the horizontal range around 150 ipm. Where optimum conditions exist, speeds can hit 300 ipm. Lap welds in heavier material, such as 3/16-in. plate, range around 100 ipm.

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by simplifying fastener design

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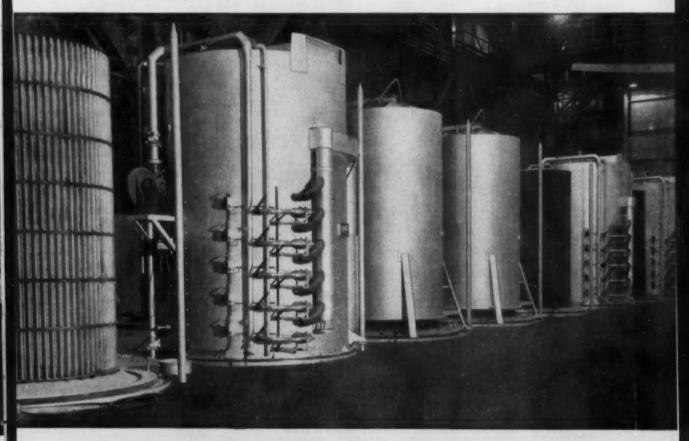
ALL the advantages of combined multiand single-stack sheet annealing facilities are provided in this Swindell Canadian installation—plus the economies in inventory and maintenance conferred by a single make of furnace, with major components interchangeable throughout. Six single-stack furnaces and 18 bases with cooling covers join with three four-stack furnaces and nine bases to assure complete flexibility in anneal-

ing operations at all times. Both furnace types feature SWINDELL horizontal radiant tubes—for controlled vertical temperature distribution, longer life and better heat application—and the new SWINDELL high volume convection system, which maintains the rugged steel mill type design for which our equipment is noted. Let us consult on your requirements!

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New Catalogues And Bulletins

Demineralization

Demineralization (ion exchange) of water is dealt with in a bulletin. (Graver Water Conditioning Co.)
For free copy circle No. 1 on postcard, p. 105

Grinders

Factory rebuilding of precision cylindrical grinders is outlined in a 4-page bulletin. (Landis Tool Co.)
For free copy circle No. 2 on postcard, p. 105

Loading Control

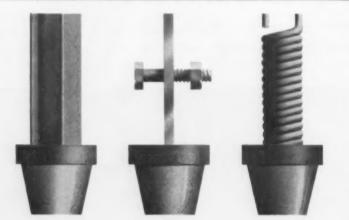
Rapid load control for testing setups is discussed in a 4-page bulletin. Such systems accommodate fatigue, temperature, strength and/or creep tests. They use electronic feedback rather than mechanical position. Thus, high precision is attained. (CDC Control Services, Inc.)

For free copy circle No. 3 on postcard, p. 105



Epoxy compounds are covered in a bulletin. Compounds are of a pure, liquid epoxy base resin. Closely controlled, it contains no diluent when cured, offers excellent electrical and mechanical properties. (Houghton Laboratories, Inc.)

For free copy circle No. 4 on postcard, p. 165



WHERE METAL PRODUCTS GROW

In four years there has been a 40% increase in the number of metalworking plants which have sunk roots in the Carolinas. A healthy industrial climate and a plentiful supply of highly productive workers provide a rare combination for their development. Recently modernized tax structures assure fair treatment and equitable taxes. And the entire region is just overnight from half the nation's population.

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D. E. Stewart, Mgr., Area Development Dept., Raleigh, N. C. Telephone TEmple 2-4611

Numerical Control

Digimatic, a precision automatic control system for table positioning, is covered in a folder. Enabling one drill press to do the work of five, the control simplifies drawing procedures, sets-up quickly. Jigs are unnecessary. (Stromberg-Carlson Div., General Dynamics Corp.)

For free copy circle No. 5 on postcard, p. 105

Construction Steels

Special steels for the heavy construction and mining industries are featured in a 12-page bulletin. (Crucible Steel Co. of America).

For free copy circle No. 6 on postcard, p. 105

Diecasting Alloys

Aluminum, magnesium and zinc diecasting alloys, some newly developed, are analyzed in a brochure. Ingot composition, mechanical properties and physical constants are tabulated on each alloy classification. It suggests diecasters and de-

signers cooperate closely. (Apex Smelting Co.)

For free copy circle No. 7 on postcard, p. 105

Machine Cleaner

A data sheet introduces a new machine which collects sludge, chips and waste oil from machine tool sumps and pits. It transports these to a disposal area and discharges under pressure. (Gorske Industrial Equipment Co.)

For free copy circle No. 8 on postcard, p. 105

Bronze Valves

A brass company's latest catalog covers its complete line bronze valves for industrial, government, and lighter-duty uses. It contains 12 pages. (Hammond Brass Works). For free copy circle No. 9 on postcard, p. 105

Zinc

"Zinc—A Mine to Market Outline" is the title of a 96-page book full of fundamental facts. History, sources, production, properties and applications are covered. Updated, the book contains late research and development findings. (American Zinc Institute.)

For free copy circle No. 10 on postcard, p. 105

Nonferrous Casting

Facilities and services of a nonferrous casting firm are described in a file folder. This foundry specializes in small and medum size castings produced in job lots and mass production quantities. The foundry casts brass, bronze, nickel-silver, lead, copper and aluminum alloys. (Non-Ferrous Casting Co.)

For free copy circle No. 11 on postcard, p. 105

Actuators

Actuators, for use with high production tooling and automation machinery, special hoists and con-

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 105.

veyors, are featured in a catalog. These actuators perform almost any mechanical movement that includes a push, pull, lift, lower, or roll-over function. The device takes little space. (Ex-Cell-O Corp.)

For free copy circle No. 12 on postcard, p. 105

Iron Pipe Fittings

An 8-page catalog gives data on ductile iron pipe fittings made under International Nickel Co. patent. Fittings include: pipe lock couplings, screwed and flanged fittings, and companion flanges. (The Kuhns Bros. Co.)

For free copy circle No. 13 on postcard, p. 105

Engineered Data

Step - by - step explanation of a control system for engineering drawings is presented in a 16-page brochure. It traces basic procedure in transforming an original engineering drawing to a frame of microfilm; inserting the film into an

CRANEMASTERS



... fill the bill for CONTINENTAL CAN CO.

This 10-ton cab-operated Cranemaster is the first of two in service for Continental Can Co. Like so many other

manufacturers, Continental Can Co. found Cranemasters the top initial value... with lasting satisfaction assured by Abell-Howe's years of experience in building overhead handling equipment that better fills the bill for industry of all kinds.

CAPACITIES TO 15 TONS
-SPANS TO 60 FT.

CRANEMASTERS FOR BETTER CONTROL OF COSTS!

First, you save on Abell-Howe low engineering and production costs! Then you save on operating costs because of Cranemaster speed and dependability... and the precise control you need for the most demanding lifting-loading jobs.

Send For Bulletin C-108



7747 Van Buren Street



Forest Park, Illinois



There's no wrestling with snarled hose lines when this Hewitt-Robins welding hose is on the job. It can't kink or curl because it's molded in *straight* sections by the exclusive H-R platen press process. Both oxygen and acetylene lines in a single integrated unit, yet each clearly color marked, means easier handling and moving, increased safety, longer wear, and time and money saved.

The patented construction of Twin-Weld hose increases flexibility, gives life-time adhesion between the two lines, eliminates coil set, and prevents any chance of leaks or ruptures between tube and cover. In-process inspection during all stages of manufacture results in the highest quality welding hose on today's market. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.



CONVEYOR BELTING AND IDLERS .:: POWER TRANSMISSION DRIVES INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

H-R Product Manufacturing Plants in Buffalo, N. Y. • Chicago, Ill. • King of Prussia, Pa. • Passaic, N. J. Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

FREE LITERATURE

aperture card; viewing and enlarging the film from the card and the use of new techniques such as electrostatic printing and dry-copy contact printing of the film in one card onto film in another. (Filmsort Co.)

For free copy circle No. 14 on postcard, p. 105

Neoprene Coatings

Neoprene protective coatings are the subject of a bulletin. These coatings can be applied in exceptionally heavy layers. (Atlas Mineral Products Co.)

For free copy circle No. 15 on postcard, p. 105

Rolling Mill

A catalog gives data on a convertible rolling mill. This unit can serve as a vertical mill for rolling powdered metals or it converts to a standard horizontal mill for rolling strip. (Fenn Mfg. Co.)

For free copy circle No. 16 on postcard, p. 105

Lift Tables

A 4-page bulletin details features and operation and lists specifications of three standard size lift tables. (Clark-Aiken Co.)

For free copy circle No. 17 on postcard, p. 105

Flexible Couplings

Flexible couplings available from one producer now come in 10 sizes. In a bulletin describing the couplings, data is included on newly designed couplings with ductile-iron flanges and special steel retaining rings. (T. B. Wood's Sons Co.)

For free copy circle No. 18 on postcard, p. 165

Motors

Tube-type motors shown in a new bulletin have capsule-mounted split-sleeve bearings. Available in standard and explosion-proof designs in ratings from 40 hp at 600 rpm through 800 hp at 3600 rpm, the motors are also available with cartridge - mounted ball or roller bearings for belt or chain drives. (Atlas-Chalmers Mfg. Co.)

For free copy circle No. 19 on postcard, p. 105

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Hand Tools

Hand tools and accessories covered in a 6-page folder handle installing, trimming and gaging of blind rivets and lockbolts. (Huck Mfg. Co.)

For free copy circle No. 20 on postcard, p. 105

Alloys

Low-temperature alloys and their uses are discussed in an 8-page brochure. Listed are 63 applications. (Cerro de Pasco Sales Corp.)

For free copy circle No. 21 on postcard, p. 105

Fork Truck

Of 4000-lb capacity, a pneumatic tire fork lift truck is gas powered. A 6-page folder gives details. (Clark Equipment Co.)

For free copy circle No. 22 on postcard, p. 105

Foundry

One of the nation's largest permanent mold and diecasting foundries is detailed in a brochure. Nearly 100 photographs and charts give the reader a plant tour. (Monarch Aluminum Mfg. Co.)

For free copy circle No. 23 on postcard, p. 105

Crawler Tractor

A 14-page catalog describes a diesel - powered crawler tractor. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 24 on postcard, p. 106

Forging Steels

Tool steels for forging operations are discussed in a 16-page bulletin. It covers recommended heat treatment for dies in drop forging; insert, extrusion, and preloaded dies; gripper dies and header dies or punches in upsetters; hot working steel projectiles on vertical or horizontal presses. (Crucible Steel Co. of America).

For free copy circle No. 25 on postcard, p. 105

Surface Plates

Periodical checking of surface plates can do away with possible costly errors. A brochure shows how inspection and resurfacing, if needed, can keep surface plates in the best of condition. (Rahn Granite Surface Plate Co.)

For free copy circle No. 26 on postcard, p. 105

Induction Heating

A brochure tells how one company provides design, engineering, fabrication, testing and installation of induction furnaces. These furnaces have a wide range of applications for heating all metals and alloys, ferrous and nonferrous. (Pittsburgh Induction Heating Co., Inc.)
For free copy circle No. 27 on postcard, p. 186

Flame-cut Plate

Circles, rings and irregular shapes described in a bulletin are available flame-cut from steel plate of any thickness. Multiple torch set-up and electric eye equipment for guiding the cutting torches are features of a service described as accurate, economical and versatile. (Joseph T. Ryerson & Son, Inc.)

For free copy circle No. 28 on postcard, p. 108

Collets

Diamond grip collets for turret lathes are described in a bulletin. It features solid collets, master collets, and collet pads for Bardons & Oliver, Foster, Gisholt, Jones & Lamson, Warner and Swasey, and Oster machines. (Sutton Tool Co.) For free copy circle No. 29 on postcard, p. 105

Contour Machine

For precision contour work, a cam - operated machine is announced in a 4-page publication. It describes how the unit accommodates boring, turning, facing, in-

Postcard valid 8 weeks only. After that use 6/26/58 own letterhead fully describing item wanted.

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FREE LITERATURE

cluding tapers, contours, grooves, undercuts, and chamfers. (Olofsson Corp.)

For free copy circle No. 30 on postcard

Handling

Illustrated, a 21-page booklet describes a line of materials handling equipment. It covers: skids; box and skid units; boxes for roll-over and bottom dumping; bar carriers, collapsible boxes; special purpose units—open end boxes, tote pans and caster-equipped boxes; painted and galvanized boxes; stacking skids; pallets; and drum racks. (Berger Div., Republic Steel Corp.)

For free copy circle No. 31 on postcard

Insulation

Insulation for large motors and generators, synchronous condensers and frequency changers, is covered in a 12-page booklet. Advantages cited include: low power factor, high tensile strength, high voltage endurance and dielectric strength, waterproof characteristics. (Westinghouse Electric Corp.)

For free copy circle No. 32 on postcard

Band Saw

High speed steel band saws are featured in a bulletin. It gives recommendations for use and specifications covering the blade sizes and pitches available in hook-tooth, regular and skip-booth types. (L. S. Starrett Co.)

For free copy circle No. 33 on postcard

Crane Hook Blocks

Crane hook blocks are covered in a bulletin. These blocks increase lifting height of cranes. (The Upson-Walton Co.)

For free copy circle No. 34 on postcard

Workpiece Driver

For use on any type engine lathe, multiple tool lathe, or plain or universal grinder, a workpiece driver is detailed in a bulletin. This workpiece driver has serrated jaws milled at an angle to grip the workpiece. It's designed to cut dogging time. (Seneca Falls Machine Co.)

For free copy circle No. 35 on postcard

Roll Grinders

Automatic roll grinding machines presented in a comprehensive booklet precision-grind large metal rolls. These roll grinders use 36, 44, 50 and 60-in. traveling wheelheads. (Cincinnati Grinders, Inc.)

For free copy circle No. 36 on postcard

Handling

A new case history bulletin tells how a metalworking plant automates its materials handling techniques. At the same time, the firm gains some 4500 sq ft of floor space. (Lewis - Shepard Products, Inc.)

For free copy circle No. 37 on postcard

Geared Coupling

Of one-piece design, a new geared coupling transmits electric power from motors to pumps, generators, speed reducers, etc. Coupling is sealed into a two-piece metal cover; this prevents loss of lubricant or entry of contaminants. (Link-Belt Co.)

For free copy circle No. 38 on postcard

Acid-resist Chain

Information in a new data sheet gives assets of X-weld acid pickle chain and X-weld Type 321 stainless steel chain. The high strength chains serve well in high temperature and acid pickling environments. (American Chain & Cable Co., Inc.)

For free copy circle No. 39 on postcard

Acoustical Ceilings

A new concept in acoustical ceilings is described in a bulletin. It involves use of perforated lay-in metal acoustical panels: Installation and removal for maintenance can be done with ease. (Diamond Mfg. Co.)

For free copy circle No. 40 on postcard



In the Caterpillar Tractor Co. plant, this D9 Tractor is being lowered onto its track roller frame assembly. Many important components of both tractor and its crawler track are fabricated from Youngstown Bars.

Accent on Excellence

Youngstown carbon and alloy steel bars

Whether they're busy at work on marine, mining, snow-removal, agriculture, oil field or logging jobs, progressive contractors and construction engineers—throughout the civilized world—rely heavily on the versatility and rugged dependability of their Caterpillar machines.

Built by Caterpillar Tractor Co., Peoria, Illinois, these advanced-design, diesel-powered, crawler units make use of the metallurgically-controlled physical properties of Youngstown Carbon and Alloy Steel Bars to provide increased strength and durability—as well as long, trouble-free service life.

Wherever steel becomes a part of things you make, the high standards of Youngstown quality, the personal touch in Youngstown service will help you create products with an "accent on excellence".



Going is rough across this river in Pennsylvania, but the maneuverability of these Caterpillar No. 583 Pipelayers makes it "child's play" to position pipe accurately.



4E

YOUNGSTOWN

SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

New Production Ideas

Equipment, Methods and Services



Slow-speed Punch Press Works With No Noise

Looking for a punch press that won't puncture ear drums while it's puncturing metal? This 15-ton, slow-speed punch press may fill the bill. It eliminates loud gear noise inherent in some presses. Incorporating a new idea in drive mechanisms, it not only boasts quiet operation, but it features a means for changing operational speeds. A new positive gearless system transmits power fully and smoothly. The drive mechanism employs the combined energy of two flywheels. High-friction, cog type Dacron

(polyester fiber) belts and a large diameter final drive pulley transmit all the power generated. Designed for hand feeding, deep drawing, continuous operation, high-accuracy roll, hopper and dial feeding, the press operates at 100 strokes per minute. Other speeds from 50 to 150 strokes per minute are readily obtained by changing a single pulley wheel. These 15-ton slow speed presses are furnished in standard 6-in. throat and 15-in. deep-throat. (Kenco Mfg. Co.)

For more data circle No. 45 on postcard, p. 105



Tracer-run Lathe Finishes Cast Steel Wheels

Tracer controlled, this vertical lathe machines cast steel wheels rapidly. Using mechanically clamped insert type carbide cutters, the high-speed lathe finish-turns a variety of dished or rolled type railroad car wheels from the rough cast or forged condition. The machine processes wheels from 33 to 42 in. diam, weighing to 800 lb. Machining time: 2 minutes 15 seconds. To solve the problem of machining a variety of wheel sizes, its builders use a 125-hp variable speed drive.

This provides necessary adjustable 20 to 80-rpm table speeds. Hydraulic controls include six hydraulic pumps driven by one 15 and one 20-hp motor, a tracer system operated by a template-controlled servo valve with a mechanical follower, and hydraulic cylinders that work a 3-jaw chuck on the outside of the rim and expanding arbor holddown in the axle hole on the work table. (Snyder Tool & Engineering Co.)

For more data circle No. 46 on postcard, p. 105



Numerical Controls Serve Job Shop Uses

Numerically controlled machine tools suitable for "job shop" use by small plants have arrived. Utilizing a Digimatic numerical control system, which has been under development for more than four years, a new machine tool demonstrates impressive performance for its relatively small size.

Simplicity of operation is a key feature. Contoured parts can be "programmed" in the morning directly from blueprints, utilizing only typical machine shop personnel; they can be automatically machined by lunch time. (Stromberg-Carlson Div., General Dynamics)

For more data circle No. 47 on postcard, p. 105



"Wire enhances motor mount appearance, dissipates noise"

... states wire products manufacturer

"The J&L wire we use in this motor mount for a large air conditioner has a bright, clean and smooth finish so necessary for high quality plating work.

"It also meets our rigid physical and welding quality specifications," reports Mr. Paul Titchener, president of E. H. Titchener & Company, Binghamton, New York, manufacturers of quality wire goods since 1886.

"This modern mount design takes advantage of the natural resiliency of wire construction. The mount weighs only 13 pounds, provides free flow of air, minimizes vibrations," according to Mr. Titchener.

J&L manufacturer's wire has a superior quality due to close control in every phase of production from ore mine to finished product.

Next time you order wire, call your J&L representative for a recommendation on the exact steel wire for your specific job. Or write direct to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

NEW EQUIPMENT

Tool Holders

New quick-change tool holders handle cutters for drilling, boring, milling, reaming, tapping and other machining operations. All present standard MMS tapered tools can be used with the holders. This gives the user a double advantage (high precision with rapid changing). A simple grinding operation makes present adapters suitable for use with the quick-change holders. (Erickson Tool Co.)

For more data circle No. 48 on postcard, p. 105

Tube Former

A leading producer of metal forming equipment recently installed this horizontal tube block at a large Eastern nonferrous tube drawing plant. The machine em-



ploys a 36-in. diam block. A 75-hp variable speed dc motor drives it. The block is capable of drawing nonferrous tubing at speeds up to 1350 fpm. (Fenn Mfg. Co.)

For more data circle No. 49 on postcard, p. 105

Welding Helmet

A combination welding helmetsound protector protects welders who work where there is exceptional noise. The sound protector unit features elongated-type ear domes. These cover the jawbone opening and effectively protect against high and low frequency noises. Ear domes swivel to fit any shape head. Vinyl sponge ear seals fit securely. A perfect seal is possible even when worn over personal or safety Rx glasses. Neoprene covered spring headband is sturdily attached to the sides of the helmet by spring-type friction joints. Vinyl foam ear puffs are easily removed and replaced for sterilization. Conversation and



signals are audible for maximum safety. The welding helmet unit comes with white or dark gray exterior shell. It's moisture-proof and well ventilated. (American Optical Co.)

For more data circle No. 50 on postcard, p. 105

Throwaway Brushes

Tired of cleaning paint brushes. These inexpensive brushes you don't have to clean; just throw them away after use. Made of bristles vulcanized in rubber, the



brushes come in sets of five, including 2, 1½, 1 and ½ brushes. Brushes can also be used for cleaning threads, swabbing grease and red lead, or other brushing jobs. (Thro-A-Way Brushes.)

For more data circle No. 51 on postcard, p. 105

How to measure

Mocu is the time to take a long, hard look

A continuous furnace is more than just a brick-lined structure built to heat a material; it is a processing tool.

Like all processing tools, it must be evaluated on an overall basis. Fuel consumption and efficiency may be completely outweighed by many more important economic factors centering around your workpiece, your total production program, and your work force.

Your evaluation may well prove that an investment now in Selas continuous heat processing will bring immediate returns in reduced costs and improved product quality.

To help you take this long, hard look at your heat processing equipment or requirements, Selas offers these 15 evaluation factors:

- Material handling
- Product value
- Material saving
- Fuel efficiency
- Automatic operation
- Temperature control
- Labor requirements
- Work in process
- Product quality
- Equipment flexibility
- Maintenance
- Production requirements
- Process coordination
- Floor space
- Human element

The factual report on the facing page tells how a steel mill took this long, hard look at its bloom reheating. Every evaluation factor proved significant: one factor alone represented savings which equalled the cost of the entire Selas furnace line in 1½ months!



the real cost of continuous heat processing

... here's how one SELAS installation stands up under that "long, hard look!"

Conventional practice of reheating blooms had been to remove them from the rolling process, charge them into batch-type reheating furnaces, soak them for 60 to 90 minutes. Blooms were then taken from the furnace, placed back onto the rolling mill table for final rolling.

At least 2 handlings of steel by mechanical manipulator were involved. It is generally agreed that picking up hot steel, transporting it 100-150 feet and setting it down, costs \$2 per ton.

Material Handling

Selas continuous heat processing has eliminated both handlings . . . saved enough to pay for the heat processing equipment in 1½ months!

Product Value

The value of the material passing through this furnace line in only 26 hours equals the cost of the entire heat processing installation!

Material Saving

Because reheating time is 3 minutes instead of the conventional 60 to 90 minutes at 2250°F, less scale is formed. This amounts to a saving of 3 tons of steel per hour—enough to pay for the continuous furnace line in only 5½ months!

Fuel Efficiency

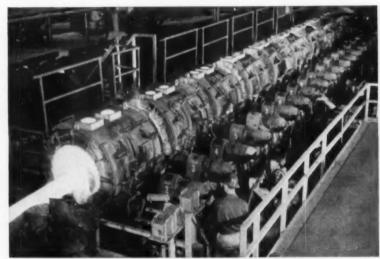
Fuel efficiency is not of major consequence because the total fuel cost is less than 0.6% of product value. Fuel efficiency could be increased through recuperation. Even if fuel efficiency could be increased by 50%, however, the cost of this additional equipment — plus higher maintenance — would add more to production cost than the 0.3% saved.

Automatic Operation

The furnace line accepts blooms at the charge-end whenever space is available in the furnace. Or, if no bloom is on the conveyor the furnaces automatically go on low temperature setting. Blooms, at optimum rolling temperature, are automatically delivered whenever required by the rail mill.

Temperature Control

Fast response of the Gradiation® furnaces permits accurate automatic control of bloom temperature. Uniform heating by radiant gas-fired Duradiant® burners produces optimum rolling temperature throughout every bloom.



Continuous Selas furnace line, located between a blooming mill and a rail mill, reheats blooms "on the fly," at rates up to 198 tons per hour.

Labor Requirements

None! Routine supervisory inspection of recording equipment is the total human contribution required.

Work in Process

Only 9½ tons of steel (maximum) need be in process to meet even the most widely varying production requirements. The previous method required 195 tons.

Product Quality

Reproducible metallurgical uniformity is achieved within each bloom and from bloom to bloom.

Equipment Flexibility

Furnace line heats blooms from 8 inches square to 11 inches square in cross-section, 8 to 22 feet long, weighing from 1744 to 9050 pounds each.

Maintenance

Simple, minimum. A stand-by barrel is quickly inserted into the line whenever major overhaul is necessary.

In 23 months of continuous operation, seven barrel furnaces have been re-lined, at a cost of only % cents per ton of reheated blooms. This is less than 0.007% of the value of product passing through

the furnace line, and amounts to but 1.03% of the total original equipment cost.

Production Requirements

The furnace line can handle up to 198 tons per hour according to fluctuating demands of the rail mill.

Process Coordination

This continuous Selas line is an integral part of the roll conveyor between the blooming mill and the rail mill.

Floor Space

Valuable floor space was saved through Selas fast heating. This entire furnace line occupies only 63 x 11 feet.

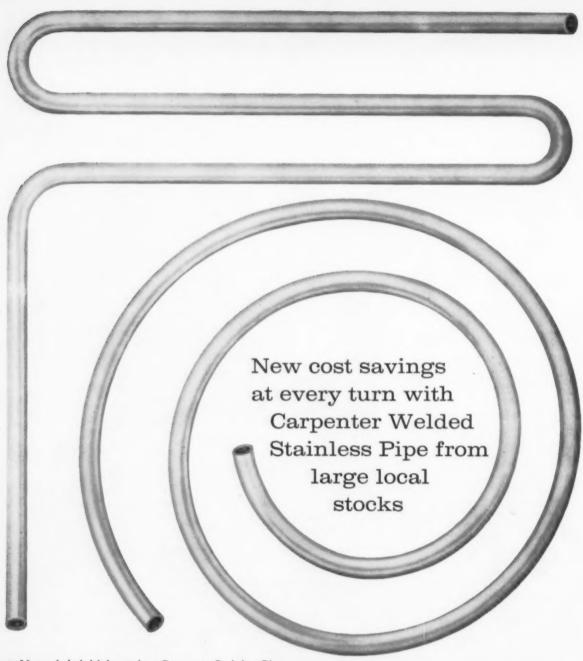
Human Element

Automatic control and operation completely eliminate variables in product quality due to the human element.

For case histories covering other steel mill heat processing operations, as well as heat treating, heating for hot working and brazing, send for reprint "An Economic Appraisal of Continuous Heat Processing." Address Dept. 16, Selas Corporation of America, Dresher, Pa.

Gradiation and Duradiant are registered trade names of Selas Corporation of America.





• Not only in initial cost does Carpenter Stainless Pipe save you money. Every step from installation through extra long service life will show Carpenter's superiority. The uniformity of Carpenter welded stainless pipe adds even more operational benefits no matter which schedule you select . . . 5, 10 or 40. Carpenter makes all three. Your local distributor can supply your needs from stock. He can give you fast delivery. For complete ordering information write for Carpenter's Selecting and Buying Guide. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.



The Iron Age Summary

Steel Price Action Up to USWA

U. S. Steel's statement is an attempt to relate labor costs to probable steel price hike.

Prices won't go up July 1. But selective increases averaging \$5.50 per ton appear inevitable.

• "Big Steel" has put steel labor on the spot.

U. S. Steel Corp. has, in effect, told Dave McDonald, president of the United Steelworkers, that it will not raise steel prices if the steel union foregoes its scheduled July 1 wage increase.

Behind the Statement—This is the gist of U. S. Steel's statement in which it said: "It must be obvious to anyone that the matter of price adjustment would not even come up under present economic circumstances if it were not for the very substantial employment cost increase we now face."

The statement will have the effect of "smoking out" Mr. McDonald, who is on record to the effect that he will "stand pat" and let wage and fringe benefits due him under his three-year contracts with steel firms take effect on July 1 as scheduled.

Kefauver Too—U. S. Steel also has turned the tables on Sen. Estes Kefauver of Tennessee. This critic of steel pricing policies has consistently soft-pedaled the impact of wage costs on the steel price structure. Between now and July 1 the Senator will have to aim his barbs at steel labor—something he does not want to do—or retreat to a "prepared position." Chances are, he'll claim credit for the price boost postponement. Actually, Sen. Kefauver's remarks have little bearing on the steel price picture.

There will be no steel price boost on July 1. However, the odds overwhelmingly favor one at any time between July 2 and September. It stands to reason that the steel companies cannot afford to absorb the substantial wage cost increases that are scheduled to take effect on July 1. Steel prices are bound to go

up unless steel labor decides to pass up what it has coming under its contracts.

Up \$5.50—When it comes, the price boost will amount to about \$5.50 per ton on a selective basis. This is about one-half the total of direct and indirect cost increases that would result from the scheduled pay hike.

Market Confused—U. S. Steel's statement also served notice on other steel companies that it is no "pushover" on price leadership. Other producers have stated freely that they feel prices should rise on July 1. But from a practical standpoint, no other steel company can boost prices unless the largest producer decides to go along.

Meanwhile, U. S. Steel's decision to hold off on a price boost has scrambled the steel market outlook for July. It had been expected that July business would fall off as a result of heavy buying in June as a hedge against a July price increase.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,687	Last Week 1,741	Month Ago 1,498	Year Ago 2,189
Ingot Index				
(1947-1949=100)	105.0	108.4	93.2	136.2
Operating Rates				
Chicago	69.0	73.0*	66.5	84.0
Pittsburgh	60.0	60.5	55.0	89.0
Philadelphia	65.0	71.0	59.5	97.0
Valley	43.5	48.0	40.5	73.5
West	74.5	79.0	80.0	104.0
Cleveland	50.0	49.0*	35.0	88.0
Buffalo	44.0	54.0	49.0	102.0
Detroit	66.0	66.5*	55.0	99.0
South	68.0	66.0	67.0	93.0
South Ohio River	63.0	64.0*	56.0	0.18
Upper Ohio River	71.5	73.0*	80.5	83.5
St. Louis	93.0	86.0	88.0	74.0
Northeast	35.5	35.5	31.0	66.5
Aggregate	62.5	64.5	55.5	85.5

*Revised

Prices At a Glance

(cents per 1b unless otherwi	This Week se noted)	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	\$66.49	\$66.49	\$66.49	\$64.56
Scrap, No. 1 hvy				
(Gross Ton)	\$35.17	\$35.17	\$35.33	\$54.83
No. 2 bundles	\$25.83	\$25.83	\$26.17	\$46.33
Nonferrous				
Aluminum ingot	26.10	26.10	26.10	27.10
Copper, electrolytic	25-26.50 2	5-26.50*	25.00	29.25
Lead, St. Louis	11.30	10.80	10.80	13.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	94.625	94.875	94.625	97.50
Zinc, E. St. Louis	10.00	10.00	10.00	10.50

Fastener Prices to Follow Steel

If the cost of steel goes up as expected, fastener makers likely will raise their own prices correspondingly.

An increase of 5 pct would just about offset price cutting in recent months.

• The industrial fastener business, after absorbing a Sunday punch from auto cutbacks this year, is coming back strong—thanks to distributor and agricultural implement markets.

Although the industry generally is running about 30 pct behind 1957, which was a good year, there has been a significant pickup in the early weeks of June—about 15 pct ahead of May. A portion, of course, is due to price hedge buying. Backlogs are now up to about 6 weeks compared to only a few days in

April. This summer may see a dip.

Price Hike Coming—One sales official said last week that fastener producers will be forced to raise their prices in line with the steel industry due to expected increased materials cost as well as higher labor costs.

Last year, fastener wire and rod went up about \$6 a ton and fasteners were raised 5-8 pct so the same pattern probably will follow this year. Because of price cutting of 5 pct or more in the fastener business in the last three months, however, an increase would just about restore previous levels.

Bright Spots—The current revival in the market is coming with little or no help from its biggest segment — automobiles. Chicago area is leading the upsurge thanks to its farm implement business

which is running less than 10 pct behind last year in a general rural market upsurge. Although farm implements represent no more than 10-15 pct of the market, this year they have been the difference between a gain and a loss.

One of the major steadying influences in the fastener market has been buying by distributors. Their ordering has continued on a regular, if reduced, basis. With a price increase in the offing now, some price hedge buying is being done by distributors but not in significant quantities.

April Low—Construction machinery has had a let down since there is still a surplus of units built last year in anticipation of the national road building program. High strength bolts in steel construction, however, continue to make gains.

The drop in auto markets for fasteners has imposed the greatest strain in years on producers. The low point was hit in April when it was running 60 pet behind last year but a slow steady revival is now in progress.

Auto Market Analysis—Fasteners, like other auto hardware, suffer worse than the auto makers when the sales drop off and inventory cutting begins. If auto sales, for example drop 50 pct, then inventory on hand is enough for double the necessary time. In terms of days supply, the parts inventory gets cut more severely than the major product because deliveries improve and capital investment can be conserved. Fastener inventories in auto plants in April were less than one week's supply.

One helpful pattern in auto markets is that new model changeovers generally have only minor effect in the fastener field.



FULL BINS: Fastener inventories in customer plants and distributor warehouses are at a high level. Above, an inspector checks diameter of screw fasteners with a micrometer before shipment to production line.



INTERNAL 870-C, only vertical internal shaver where a heavy mass (chuck and gear) drives the cutter. Reversals impose no abnormal loads on cutter teeth. This prevents excessive cutter breakage. Extras—plunge shaving.



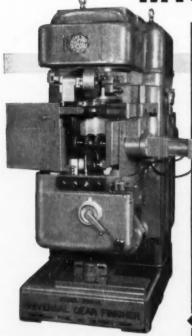
UNDERPASS 870 Gear Finisher for fastest shaving—long or short run—of spur, helical, herringbone or shoulder gears. Extras—the new knee, new cutter-saving drive, crowning cutters, easy to set up and operate.



READILY AUTOMATED—Michigan 870 and 870-A shavers can be partly or fully automated. They are the only vertical shaving machines featuring 'straight-through' automation. They can be automated to load or unload from front or back.

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...look for the extras



May we have the Michigan Tool engineering representative in your area show you how Michigan gear finishing can make your geared parts even better. Michigan's latest 870-series Gear Finishers are loaded with EXTRAS. A new knee assembly brings all controls to the front—and puts the operator closer to the work. Operators like ease of setup, vernier and dial locating, and the simple locking. Work located above cutter makes manual loading safer, automatic loading easier. Machine ways are up out of the way of contamination by chips or foreign matter. Timken bearings, extra-rugged fully splined shafts and a shock-absorbent drive, provide a sturdy no-backlash drive. Starts and stops are cushioned to keep cutters operating longer. Every installation has the EXTRA of being individually Michigan Application Engineered to cut costs.

Write for descriptive literature.

UNIVERSAL 870-A (with new knee) permits adjustable automatic upfeed to be used with any of the three basic shaving methods. Extras—faster approach, longer tool life. Optional crown shaving attachment (permits shaving of a series of gears with varied crowns using only one tool).



How Much Will July Sales Sag?

Steel users, after brisk buying to beat looked-for price increases, may lose interest in July tonnages.

Meanwhile stainless welded pipe prices weaken in tight competitive market.

• How strongly will the steel order tide run in July?

After a busy June sparked by substantial price hedge buying mills have their fingers crossed. "May and June were good," says one sales manager, "but we don't expect much from July and possibly even August. Hedge buyers are pretty well bought out. And even companies which had holes in inventories have about satisfied their needs."

Some buyers are showing signs of less purchasing interest. When current orders can't be filled for June delivery they won't accept July shipment. Mills report July tonnages on plate, sheet, bar, and structurals are slow coming in.

There are some bright spots in the market. Galvanized and specialty sheets are strong. Wire products are moving well. Buyers are stocking up on wide mill plate.

Stainless Pipe—Sharpened price skirmishing is the latest sign of softness in stainless pipe sales. Price cuts which began in the Southwest in April have been spreading.

They began at warehouse levels, then reached some producers. Not all mills are yet involved and a few of the largest, like U. S. Steel, are adopting a wait - and - see attitude. Some pipe producers are reluctant to admit they have made downward adjustments. Yet IRON AGE has confirmed sales at lower base prices as far west as Chicago.

Sources there indicate stainless welded pipe prices were reduced in April and again this month. These were apparently moves to counteract price cutting by suppliers further east.

New price schedules on welded stainless pipe are in preparation at Allegheny Ludlum's Wallingford Steel Co. When published, they reportedly will show average price drops of 10-12 pct, plus changes in quantity adjustments on terms of a 10,000 lb base.

Sheet and Strip—The rush of June business has extended sheet delivery in some areas by 1 to 2 weeks. Sheet shipments for a Pittsburgh area producer jumped 25 pct in June. Nevertheless, July will show a slowdown despite the fact some mills enter the month with tonnage carryovers. One producer believes July shipments will be about on a level with those of May.

Nails — Dickson Weatherproof Nail Co. has announced it will not increase prices on July 1 at its Birmingham, Ala., Evanston, Ill., and Galveston, Tex., nail manufacturing plants.

Dickson, in reporting its decision to hold the price line, comments that it does not feel an additional price increase can be absorbed by its customers at the present time.

Pipe and Tubing—As the wave of price hedge buying passes, the mills expect a slow July. Meanwhile May and June have seen an increase in shipments of standard pipe and linepipe. Buttweld deliveries also advanced a little during this month. Sales of mechanical tubing and oil country seamless are still lagging.

Wire Products—Many mills will enter July with a heavy carryover on wire items because of the surge of June price hedge buying. As a result, production levels for wire mills are now at about 70 pct of capacity. July rates will probably fall to around 35 pct of capacity.

Merchant wire product shipments are now facing a shipping logjam.

Delivery Promises at a Glance

	Pittsburgh	Chicago	Cleveland	Detroit	East	West Coast
CR Carbon Sheet	3-5 wks	2-3 wks	2-4 wks	2-4 wks	3-5 wks	4 wks
HR Carbon Sheet	2-3 wks	1-2 wks	2-3 wks	2-3 wks	2-3 wks	3-4 wks
CR Carbon Strip	3-5 wks	2-4 wks	2-4 wks	2-4 wks	3-5 wks	4-6 wks
HR Carbon Strip	2-3 wks	1-2 wks	2-3 wks	2-3 wks	2-3 wks	3-4 wks
HR Carbon Bars	1-2 wks	1-2 wks	2 wks	1-3 wks	2-4 wks	2-3 wks
CF Carbon Bars	1-4 wks	1-3 wks	1 wk	1-3 wks	1-3 wks	1-2 wks
Heavy Plate	1-4 wks	3-4 wks			3-5 wks	4-6 wks
Light Plate	1-2 wks	1-2 wks	2-3 wks		2-3 wks	4-6 wks
Merchant Wire	1 wk	2-3 wks	1 wk		Stock	3-4 wks
Oil Country Goods	Stock	1-2 wks	2-3 wks		Stock	
Linepipe	1-8 wks	2-4 wks	3-4 wks		2-4 wks	4-6 wks
Buttweld Pipe	1-2 wks	1-3 wks	1 wk	1-2 wks	Stock	2-4 wks
Std. Structurals	1-4 wks	1-3 wks		1-4 wks	2-4 wks	4 wks
CR Stainless Sheet	2-4 wks		1-2 wks	1-2 wks	1-2 wks	
CR Stainless Strip	2-3 wks		1-2 wks	1-2 wks	1-2 wks	

COMPARISON OF PRICES

(Effective June 24, 1958)

of major producing	page are the average areas: Pittsburgh,		
Youngstown.		- related to We	T

declines appear in Italica.	meen are	printed		-,,,-,
	June 24 1958	June 17, 1958	May 26 1988	June 25 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925∉	4.9254	4.9254	4.675€
Cold-rolled sheets	6.08	6.08	6.06	5.75
Galvalized sheets (10 ga.)	6.60	6.60	6.60	6.80
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	18.15	13.15	10.40
Stainl's C-R strip (No. 802)	52.00	52.00	52.00	\$0.00

Tin and Terneplate: (per base bor Tinplate (1.50 lb.) cokes Tin plates, electro (0.50 lb.) Special coated mfg. ternes	x) \$10.80 9.00 9.55	\$10.30 9.00 9.55	\$10.30 9.00 9.55	\$10.30 9.00 9.55
Bars and Shapes: (per pound) Merchant bar	5.425¢	5.428∉	5.425¢	5.0754
Cold finished bars	7.30	7.30 6.475	7.30 6.475	6.85
Structural shapes	5.275 45.00	5.275 45.00	5.275 45.00	5.00 48.25

Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound) Bright wire	7.65¢	7.65∉	7.65¢	7.20∉
Rails: (per 100 lb.) Heavy rails Light rails	\$5.525 6.50	\$5.525 6.50	\$5.525 6.50	\$5.275 6.25
Semifinished Steel: (per net ton)			****	****

Detoining Onites #11.00	@11-0V	#11.0V	# (4. UU
Slabs, rerolling 77.50	77.50	77.50	74.00
Forging billets 96,00	96.00	96.00	91.50
Alloy blooms, billets, slabs 114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)			
Wire rods 6.15¢	6.15€	6.15¢	5.80€
Skelp 4.875	4.875	4.875	4.625

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

5.670¢

5.967é

5.9674

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	June 24 1958	June 17 1958	May 26 1958	June 25 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila	870.97	\$70.97	\$70.97	\$68.88
Foundry, Valley		66.50	66.50	65.00
Foundry, Southern Cin'ti		73.87	73.87	67.17
Foundry, Birmingham		62.50	62.50	59.00
Foundry, Chicago		66.50	66.50	65.00
Basic, del'd Philadelphia		70.47	70.47	68.38
Basic, Valley furnace		66.00	66.00	64.50
Malleable, Chicago		66.50	66.50	65.00
Malleable, Valley		66.50	66.50	65.00
Ferromanganese 74-76 pct Mn				
cents per lb\$		12.25	12.25	12.75
Pig Iron Composite: (per gross		866.49	866.49	864.56

rig Iron Composite: (per gross tor Pig iron \$		866.49	866.49	\$64.56
erap: (per gross ton)		\$37.50	\$37.50	\$56.50
	37.50 33.50	88.50	34.00	56.50
	34.50	34.50	84.50	\$1.50
	31.50	81.50	26.50	46.50
	87.50	37.50	87.50	56.50
	48.50	48.50	48.50	57.50
No. 1 mach'y cast, Phila	47.50	47.50	47.50	56.50
No. 1 mach'y cast, Chicago	5.00 to			
	6.00	46.50	46.50	51.50

No. 2 bundles		25.83	25.83	26.17	46.33
Coke Connellsvill Furnace coke, p Foundry coke, p	e: (per net ton prompt prompt\$17.50	\$15.38	\$15.38	\$15.38 17.50-\$19	\$15.38 \$17.50-\$19

Nonferrous Metals: (cents per pound to	large buyer	rs)	
Copper, electrolytic, Conn25-26.50	25.26.50*	25.00	29.25
Copper, Lake, Conn 25.00	25.00*	25.00	29.25
Tin, Straits, N. Y 94.625	† 94.875°	94.625	97.50
Zinc, East St. Louis 10.00	10.00	10.00	10.50
Lead. St. Louis 11.30	10.80	10.80	13.80
Aluminum, virgin ingot 26.10	26.10	26.10	27.10
Nickel, electrolytic 74.00	74.00	74.00	74.00
Magnesium, ingot 36.00	36.00	36.00	36.00
Antimony, Laredo, Tex 29.50	29.50	29.50	33.00
A Charles & Assessed & Deviced			

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Trade Digs In For Slow Summer

July looks like a poor month for the scrap trade. Hopes are for a better August.

The issue now is whether the trade can hold out while waiting for an improved market.

■ The trade seems determined to ride out a very slow July in anticipation of better things to come in August.

The outlook for significant purchases next month is not encouraging to brokers and dealers. Vacation shutdowns will be heavy in the steel industry and even more so among foundry consumers of cast grades.

On the other hand, auto shutdowns will cut generation of choice automotive list scrap to a trickle. Some strengthening in recent industrial lists has been noted, probably a reflection of future lists rather than immediate need.

In Chicago, where a significant price weakening was in evidence throughout the past few weeks, declines came to a halt and further attempts to cut prices were rebuffed.

Scrap generation is very slow and, in view of apathy at both dealer and consumer levels, no radical price fluctuations are expected in the near future. Moderate declines are more likely than advances, unless July steel orders pick up.

Pittsburgh — Prices continue to hold in a quiet market here. There is not enough trading to test prices, but the feeling is that No. 1 heavy

melting cannot be bought for less than \$38 in any quantity. The firmness comes partly from anticipation of greater strength in August. This hope, along with a seasonal decline in industrial scrap generation, has been enough to hold up the market despite a lack of mill demand. Yards are paying around \$16 for machine shop turnings, but there is no mill interest in blast furnace grades.

Chicago—A strong drive to push down the market ground to a halt against increasing dealer resistance. Only in foundry grades, where vacation shutdowns are expected to begin soon, was there any indication that dealers were willing to ship scrap from their reduced yard stocks.

Philadelphia — The market is quiet but prices are holding steady. Very little new business is expected from domestic mills in the weeks ahead or from foundries as vacation shutdowns near. Opinion is divided as to the export outlook. Several dealers report they have been approached for August export commitments.

New York—Additional consumers have entered the stainless scrap market, boosting prices for both 18-8 solids and turnings \$10 per ton. Brokers stress that the price action results from lack of material rather than size of the orders. Steelmaking, turnings and cast grades are very quiet, with little business of any kind. Prices of these grades are unchanged.

Detroit—This market is dead. Dealers and brokers are concentrating on industrial lists this week. A slight weakening is expected in July, but any price changes should be minor. One indication of softening market is that scrap sold between dealers has been reduced about \$1 in the past week.

Cleveland—Market showed underlying strength when an excess auto list sold at about the same levels as a month ago. Lists this week are expected to hold strength due to anticipated short month in August when auto plants change over.

St. Louis—Brokers paid from \$1 to \$2 higher for railroad lists closing at the week end. The movement of scrap is slightly better, but still only fair.

Birmingham — With the exception of a purchase of No. 2 heavy melting by an Atlanta mill, at no change in price, the steel scrap market continues inactive. A large foundry returned to the market, however, with a sizable order for cast at prevailing prices.

Cincinnati — Foundry business continues to drag since the long area strike. Although a rush was expected, patterns and other equipment are still scattered so purchases have been small.

Buffalo—Inactivity continues to haunt the market here. Prices are unchanged. With several foundries planning two to three weeks shutdowns next month, the immediate picture looks black.

Boston — Primary grades are down \$1. Clean cast chemical borings, unstripped motor blocks, and No. 2 bundles are hard for dealers to move. There is no export demand and very little domestic activity.

West Coast—Prices are steady, but with very little scrap moving. The market is in a state of suspended animation in all three Coast areas. Dealers are gloomy on the outlook for July and August.

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THE MOST POWERFUL NAME IN CRANES

CRANE AND SHOVEL CO.

CHICAGO 5, ILLINOIS

SCRAP PRICES (Effective June 24, 1958)

Pittsburgh

No. 1 hvy. melting		
No. 2 hvy. melting	31.00 t	0 32.00
No. 1 dealer bundles	37.00 t	0 38.00
No. 1 factory bundles	41.00 t	0 42.00
No. 2 bundles	27.00 t	0 28.00
No. 1 busheling	37.00 t	0 38.00
Machine shop turn	15.00 t	
Mixed bor. and ms. turn	15.00 t	
Shoveling turnings	19.00 t	
Cast iron borings	19.00 t	
Low phos. punch'gs plate.	40.00 t	
Heavy turnings	32.00 t	
No. 1 RR hvy. melting	40.00 t	
Scrap rails, random lgth	50.00 t	
Rails 2 ft and under		
DD stall and under	53.00 t	
RR steel wheels	45.00 t	
RR spring steel	45.00 t	
RR couplers and knuckles	45.00 t	
No. 1 machinery cast	48.00 1	
Cupola cast	39.001	
Heavy breakable cast	37.001	to 38.00
Stainless		
18-8 bundles and solids.	175.00 1	to 185.00
18-8 turnings		105.00
430 bundles and solids :		
410 turnings		
7		

Chicago

No. 1 hvy. melting\$34.00 to \$35.00
No. 2 hvy. melting 32.00 to 33.00
No. 1 dealer bundles 34.00 to 35.00
No. 1 factory bundles 40,00 to 41,00
No. 2 bundles 26.00 to 27.00
No. 1 busheling 34.00 to 35.00
Machine shop turn 17.00 to 18.00
Mixed bor. and turn 19.00 to 20.00
Shoveling turnings 19.00 to 20.00
Cast iron borings 19.00 to 20.00
Low phos. forge crops 44.00 to 45.00
Low phos. punch'gs plate. 41.00 to 42.00
Low phos. 3 ft and under 39.00 to 40.00
No. 1 RR hvy. melting 41.00 to 42.00
Scrap rails, random lgth 47.00 to 48.00
Rerolling rails 54.00 to 55.00
Rails 2 ft and under 51.00 to 52.00
Locomotive tires cut 48.00 to 49.00
Cut bolsters & side frames 45.00 to 46.00
Angles and splice bars 49.00 to 50.00
RR steel car axles 60.00 to 61.00
RR couplers and knuckles 45.00 to 46.00
No. 1 machinery cast 45.00 to 46.00
Cupola cast 38.00 to 39.00
Heavy breakable cast 35.00 to 36.00
Cast iron brake shoes 36.00 to 37.00
Cast iron wheels 33.00 to 34.00
Malleable 49.00 to 50.00
Stove plate 36.00 to 37.00
Steel car wheels 43.00 to 44.00
Stainless
18-8 bundles and solids. 175.00 to 180.00
18-8 turnings 95.00 to 100.00
430 bundles and solids 100.00 to 105.00
430 turnings 55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	33.00	to	\$34.00
No. 2 hvy. melting	29.00	to	30.00
No. 1 dealer bundles	33.00	to	34.00
No. 2 bundles	23.00	to	24.00
No. 1 busheling	33.00		
Machine shop turn	14.00		
Mixed bor. short turn	15.00		
Cast fron borings	16.00		
Shoveling turnings	17.00		
Clean cast. chem. borings	24.00		
Low phos. 5 ft and under	38.00		
Low phos. 2 ft and under	39.00		
Low phos. punch'gs	39.00		
Elec. furnace bundles	34.00		
Heavy turnings	28.00		
RR steel wheels	42,50		
RR spring steel	42.50		
Rails 18 in. and under	55.00		
Cupola cast.	37.00		
Heavy breakable cast	39.00		
Cast Iron car wheels	41.00		
Malleable	58.00		
Unstripped motor blocks	30.00		
No. 1 machinery cast	47.00	to	48.00

Cincinnati

Brokers buying prices per gro	es ton.	on	CRES:
No. 1 hvy. melting			
No. 2 hvy. melting			
No. 1 dealer bundles			
No. 2 bundles	22.00	to	23.00
Machine shop turn			12.00
Mixed bor. and turn			13.00
Shoveling turnings	14.00	to	15.00
Cast iron borings	12.00	to	13.00
Low phos. 18 in. and under	39.00	to	40.00
Rails, random length	43.00	to	44.00
Rails, 18 in. and under	53.00	to	54.00
No. 1 cupola cast	39.00	to	40.00
Hvy. breakable cast	32.00	to	33.00
Drop broken cast	45.00	to	46.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting \$\text{No. 2 hvy. melting}\$ No. 1 dealer bundles No. 1 factory bundles No. 2 bundles No. 2 bundles No. 1 busheling Machine shop turn. Mixed bor. and turn. Shoveling turnings Cast iron borings	32.50 to 24.50 to 32.50 to 38.00 to 20.50 to 32.50 to 10.00 to 14.00 to 14.00 to	\$33.50 25.50 33.50 39.00 21.50 33.50 11.00 15.00 15.00
Cast from borings		10.00
Cut structural & plates, 2 f	t	
& under	38.00 to	39.00
Drop forge flashings	32.50 to	33.50
Low phos, punch'gs plate.	33.50 to	34.50
Foundry steel, 2 ft & under	35.00 to	36.00
No. 1 RR hvy. melting	35.00 to	
Rails 2 ft and under	53.00 to	
Daile 19 in and under		
Rails 18 in. and under	54.00 to	
Railroad grate bars	14.00 to	
Steel axle turnings	17.00 to	
Railroad cast	46.00 to	47.00
No. 1 machinery cast	46.00 to	47.00
Stove plate	42.00 to	43.00
Malleable	58.00 to	
Stainless	00.00 00	00.00
18-8 bundles	175 00 to	195 00
18-8 turnings	05 00 to	100.00
420 hondles	95.00 to	
430 bundles	90.00 to	
430 turnings	35.00 to	40.00

Buffalo	
No. 1 hvy. melting\$26.00 to	\$27.00
No. 2 hvy. melting 22.00 to	23.00
No. 1 busheling 26.00 to	27.00
No. 1 dealer bundles 26.00 to	27.00
No. 2 bundles 20.00 to	21.00
Machine shop turn, 10.00 to	11.00
Mixed bor, and turn, 11.00 to	12.00
Shoveling turnings 13.00 to	14.00
Cast iron borings 12.00 to	13.00
Low phos. plate 32.00 to	33.00
Structurals and plate.	
2 ft and under 35.00 to	36,00
Scrap rails, random lgth 39.00 to	40.00
Rails 2 ft and under 49.00 to	50.00
RR steel wheels 36.00 to	37.00
RR spring steel32.00 to	33.00
RR couplers and knuckles 32.00 to	33.00
No. 1 machinery cast 43.00 to	44.00
No. 1 cupola cast 39.00 to	40.00

St. Louis			
No. 1 hvy. melting\$	33.00	to	\$34.00
No. 2 hvy. melting	30.00	to	31.00
No. 1 dealer bundles	33.00	to	34.00
No. 2 bundles	25.00	to	26.00
Machine shop turn	15.00	to	16.00
Cast iron borings	19.00	to	20.00
Shoveling turnings	19.00	to	
No. 1 RR hvy, melting	38.00	to	39.00
Rails, random lengths	45.00	to	46.00
Rails, 18 In. and under	50.00	to	
Angles and splice bars	43,00		
Std. steel car axles	52.00		
RR specialties	41.00		
Cupola cast	43.00		
Heavy breakable cast	32.00		
Cast iron brake shoes	35.00		
Stove plate	39.00		
Cast fron car wheels	37.00		
Rerolling rails	55.00		
Unstripped motor blocks	34.00		
chier pres motor blocks.	02,00	10	00.01

Birmingham

No. 1 hvy. melting No. 2 hvy. melting	25.00		
No. 1 dealer bundles	30.00	to	31.00
No. 2 bundles	19.00	to	20.0
No. 1 busheling	30.00	to	31.00
Machine shop turn	20.00	to	21.0
Shoveling turnings	21.00	to	22.0
Cast iron borings	12.00	to	13.00
Electric furnace bundles		to	35.0
Elec. furnace, 3 ft & under	32.00	to	33.0
Bar crops and plate	37.00	to	38.0
Structural and plate, 2 ft.	36.00	to	37.0
No. 1 RR hvy. melting		to	33.0
Scrap rails, random lgth		to	
Rails, 18 in. and under		to	47.0
Angles & splice bars		to	40.0
Rerolling rails	46.00	to	
No. 1 cupola cast	49.00		
Stove plate	49.00	to	50.0
Charging box cast	22.00		
Cast iron car wheels	34.00		
Unstripped motor blocks.			

Youngstown

io. 1 hvy. melting\$36.00	to	\$37.00
lo. 2 hvy. melting 28.00	to	29.00
lo. 1 dealer bundles 36.00) to	37.00
io. 2 bundles 25.00	to	26.00
fachine shop turn 12.50	to	13.50
hoveling turnings 17.50	to	18.50
ast iron borings 17.50) to	18.50
ow phos. plate 37.00		38.00

New York	
Brokers buying prices per gross ton, or	cars:
No. 1 hvy. melting\$26.00 to	
No. 2 hvy. melting 23.00 to	24.00
No. 2 dealer bundles 15.00 to	16.00
Machine shop turn 7.00 to	8.00
Mixed bor, and turn 10.00 to	
Shoveling turnings 10.00 to	11.00
Clean cast, chem, borings, 22,00 to	23.00
No. 1 machinery cast 34.00 to	35.00
Mixed yard cast 32.00 to	
Charging box cast 31.00 to	
Heavy breakable cast 31.00 to	32.00
Unstripped motor blocks., 22.00 to	23,00
Stainless	
18-8 prepared solids155.00 to	
18-8 turnings 55.00 to	
430 prepared solids 65.00 to	
420 tunnings 20.00 to	95 00

Detroit		
Brokers buying prices per gro	ss ton, or	rears:
No. 1 hvy. melting \$	28.00 to	\$29.00
No. 2 hvy. melting	22.00 to	23.00
No. 1 dealer bundles	31.00 to	32.00
No. 3 bundles	17.00 to	18.00
No. 1 busheling	28.00 to	
Drop forge flashings	27.00 to	
Machine shop turn	9.00 to	
Mixed bor. and turn	10.00 to	11.00
Shoveling turnings	11.00 to	12.00
Cast iron borings	11.00 to	12.00
Low phos. punch'gs plate.	30.00 to	31.00
No. 1 cupola cast	36.00 to	38.00
Heavy breakable cast	26.00 to	27.00
Mixed cupola cast	37.00 to	38.00
Automotive cast	37.00 to	38.00
Stainless		
18-8 bundles and solids.		175.00
18-8 turnings		
430 bundles and solids		
410 turnings	20.00 to	25.00

BOSION			
Brokers buying prices per gros	s ton.	on	CBF8:
No. 1 hvy. melting	22.00	to \$	23.00
No. 2 hvy. melting	17.00	to	18,00
No. 1 dealer bundles	22.00	to	23.00
No. 2 bundles	14.00	to	15.00
No. 1 busheling	22.00	to	23.00
Machine shop turn	5.00	to	6,00
Mixed bor, and short turn.	5.00	to	6.00
Shoveling turnings	7.00	to	8,00
	14.00	to	15.00
No. 1 machinery cast	31.00	to	32.00
Mixed cupola cast	26.00	to	27.00
Heavy breakable cast	27.00	to	28.00
Stove plate	26.00	to	27.00
Unstripped motor blocks	22,00	to	23.00

~~	III I I MILETONE					
	. 1 hvy. melting					\$32.0
No	. 2 hvy. melting					30.0
	. 1 dealer bundles .					28.0
No	. 2 bundles					22.0
Ma	chine shop turn					15.0
Ca	st iron borings		N			15.0
No	. 1 RR hvy. melting					32.0
No	. 1 cupola cast					45,0

Los Angeles	
No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles \$27.00 to	28.00
No. 2 bundles	17.00
Machine shop turn 9.00 to	
Shoveling turnings 11.00 to	
Cast iron borings 11.00 to	13.00
Elec. furn 1 ft and under	43,00
(foundry)	33.00
No. 1 RR hvy. melting	41.00
No. 1 cupola cast	41.00
Seattle	

No. 1 hvy. melting No. 2 hvy. melting No. 2 bundles No. 1 cupola cast. Mixed yard cast. Hamilton, Ont.

No. 1 hvy. melting		\$30.
No. 2 hvy, melting		26.
No. 1 dealer bundles		30.
No. 2 bundles		23.
Mixed steel scrap		25.
Busheling		20
Bush., new fact., prep'd	****	30
Bush., new fact., unprep'd		24.
Machine shop turn		15.
Short steel turn.		19,
Mixed bor. and turn		39
Rails, rerolling	45 00 to	

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE



Rub specimen with emory paper to get clean surface.



Add 1 drop of 10% Hydrochloric Acid; allow 1 minute reaction time. Add 1 drop of 10% Potassium Ferricyanide; after 30 seconds, if red, green or yellow-brown color appears—or no color, sample belongs to nickel alloy group.

Here is how to test for

MONEL



Add 1 drop of concentrated Nitric Acid and wait 1 minute. If it turns cloudy blue-green, the material belongs to the nickel-copper alloy group. Add a second drop of concentrated Nitric Acid. Yellow-green color after 5 minutes indicates MONEL or R MONEL. Clean another area of the specimen and add 1 drop of 1.1 Nitric Acid; allow 8 minutes reaction time. A bright green color indicates MONEL.

This nickel-copper alloy first appeared in 1905 when the chemical industry as we know it today was being born. It is especially valuable for use where such corrosives as sea water, sulphuric acid and

strong caustic solutions are encountered. For this reason, it is frequently used by the paper and pulp industry as well as in the production of byproduct coke and gas, salt and petroleum.

Monel scrap, because of its nickel-copper content, is used in the production of the important low-alloy high strength steels. The non-ferrous foundry industry also finds it useful in the production of copper

base alloys containing nickel. To satisfy this use of Monel it is important that it be separated from other scrap.

Our personnel, equipment, experience and strategically located facilities are specifically geared to supply you with dependably segregated alloy metals in any required amount. We welcome your inquiry.

Turia Brothers and Company, Inc.

MAIN OFFICE . PHILADELPHIA NATIONAL BANK BUILDING, PHILADELPHIA 7, PENNSYLVANIA.

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Copper Price Rise Sputters

Trade believes Anaconda will drop back as other producers don't join in price hike.

Custom smelters retreat to 251/2¢ per lb as more realistic.

 "Anaconda's price hike fell flat on its face," comments the sales manager of a major brass mill.

Most of the trade is not so emphatic. But the consensus is that the attempt at a 1½¢ per lb boost in the price of copper, made last week by Anaconda, has failed.

At the beginning of the week neither Phelps Dodge nor Kennecott had gone along, and there was little prospect they would. Representatives of both producers indicated, unofficially, their prices weren't raised because business didn't warrant it.

No Concession—As of the beginning of this week Anaconda hadn't conceded. A company spokesman said unofficially, that sales levels were holding up well at the higher price. Despite this, many in the trade believe it is only a matter of time.

"For all intents and purposes, they have already dropped back," said one copper seller. He was referring to the fact that while the Anaconda mill subsidiary, American Brass Co., has published new prices, it is invoicing on the basis of 25¢ copper "to meet the competition."

Brass mills reported a buying flurry right after the Anaconda move, possibly as a hedge. But as soon as it became apparent the other producers weren't eager to move up, it petered out. Smelters Drop Back — Custom smelters which matched the Anaconda price within hours said business has dried up. They have dropped back to 25½ per lb, call this "more realistic."

Speculation in the trade is that Anaconda was looking ahead to (1) a 1.7¢ per lb tariff likely to take effect after June 30, and (2) the government program to stockpile domestic copper.

The duty on copper has only been suspended until June 30. There is a bill before Congress to extend this another year, but it is given little chance. Among the major producers, Anaconda has the most extensive foreign interests. A few observers believe if Anaconda could hold out until July 1, the other producers might move under the pressure of the tariff.

Move to 27½?—The Administration is pushing a plan to stockpile 150,000 tons of domestic copper in a year, "at a market price not to exceed 27½¢ per lb."

Some sources say Anaconda might have been trying to see if the price could be eased up to the maximum without discouraging industry buyers.

While there appears to be enough support to put the bill over, there is still a question on the money to support the program. Some sellers say it will be easier to get the program and the appropriation if the price stays at current depressed levels.

While this try may have failed, don't write off the possibility of a higher producers' copper price this year. If both the stockpile plan and the tariff go through, producers may feel justified selling at 26¢ or 26½ ¢

per lb if business shows any signs of picking up in the last quarter or late in the third.

Lead

Major sellers call the market quiet. Apparently much of the buying which drove the price to 11½¢ per lb was based on the possibility of a stockpile clause in the revised Seaton Plan.

When this didn't materialize, some buyers backed out of the market. However, there is still some political support for a lead stockpile, and the price is not likely to change much until the issue is resolved.

Nickel

Freeport Sulphur Co. will be in the nickel business in Cuba by 1959. The company has already announced its intention to go after new nickel uses. And it doesn't expect to run into too much trouble.

Tin prices for the week: June 18—94.875; June 19—95.00; June 20—94.75; June 23—94.75; June 24—94.625.*

*Estimate

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.00	26.00	4/1/58
Aluminum inget	26.10	28.10	4/1/58
Copper (E)	25-26.50	25.00	6/16/58
Copper (CS)	25.50	26.50	6 23 58
Copper (L)	25.00	27.00	1/13/58
Lead, St. L.	11.30	10.80	6/18/58
Load, N. Y.	11.50	11.00	6/18/58
Magnesium inget	38.00	34.00	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	185-200	200-250	4/1/58
Zinc, E. St. L.	10.00	10.80	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/87

ALUMINUM: 99% ingot frt allwd. COP-PER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colbourne, Canada. ZING: prime western. TIN: see above; other primary prices, pg. 124.



"ten tough production steps prove superiority of J&L cold finished bars"

These 3½" round nuts for the hydraulic mechanism of a heavy duty tractor are machined by the Industrial Nut Corporation, Sandusky, Ohio, from J&L cold finished 1045 leaded steel bars.

Nut blanks are cut from the bar, countersunk, chamfered, heat-treated, slotted on two sides, reamed, tapped, drilled with five holes, grooved on the outside edge and faced. "J&L 1045 leaded steel bars meet our exacting quality specifications for these operations," states Mr. Del Allen, foreman with Industrial Nut.

Machining perfection like this is possible in your operations with J&L cold finished steel bars, quality-controlled from ore to finished steel. A J&L steel specialist can recommend exactly the right steel for any job from J&L's complete cold finished line. He can help you get higher cutting speeds, longer tool life, improved finishes.

Try J&L superior quality bars on your next job. Call your local distributor for fast, complete service or write to Jones & Laughlin Steel Corporation, Dept. 403, 3 Gateway Center, Pittsburgh 30, Pennsylvania.



On a single-spindle screw machine, a 3½-inch round nut blank is cut from J&L cold finished 1045 leaded steel bars, countersunk and chamfered. The complete 10-step production is a real test of steel quality.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt.,frt. allowed) Flat Sheet (Mill Finish and Plate) ("F" temper except 6061-0)

Alloy	.032	.081	.136-	3.250-
1100, 3003	44.6	42.3	41.1	41.7
	52.0	46.9	45.2	44.4
	49.4	45.0	43.2	43.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	45.0-46.8 45.7-47.2 49.0-49.5	58.4-62.1 59.3-63.8 70.1-74.8
36-38	58.0-58.6	94.2-97.8

Screw Machine Stock-2011-T-3

Size"	34	3/6-5/6	%-1	11/4-11/4
Price	61.0	60.5	59.0	56.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	190	144
.019 gage	\$1.411	\$1.884	\$2.353	\$2.823
	1.762	2.349	2.937	3.524

(F.o.b. shipping Pt., carload frt. allowed) Sheet and Plate

Type→	$Gage \rightarrow$.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stan Grade	d,		67.9	69.0	77.9	108.1
AZ31B Spec						-
Tread Plate			70.6	71.7		
Tooling Plat	e	73.0				

Extruded Shapes

factor->	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

NICKEL, MONEL, INCONEL

	n. second lin		
"A	" Nickel	Monel	Incone
Sheet, CR	126	106	128
Strip, CR		108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube .	157	129	200
Ohat blanks		977	

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube	
Copper	48.13		45.36	48.32	
Brass, 70/30	42.69	43.23	42.63	45.60	
Brass, Low	44.90	45.44	44.84	47.71	
Brass, R L	45.67	46.21	45.61	48.48	
Brass, Naval	47.07		41.38	50.48	
Muntz Metal	45.19	.,,,,,,,	41.00		
Bomm. Bz.	46.98	47.52	46.92	49.54	
Mang. Bs.	50.81		44.91		
Phos. Bs. 5%	67.17		67.67		

		- 1		1	_
Free	Cutting	Brass	Rod	 	31.03

TITANIUM

(Freight included in 5000lbs)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.96; Plate, HR. commercially pure, \$6.00-\$6.75; alloy, \$8.75-\$9.50. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forgat, commercially pure, \$5.25-\$6.36; billets, HR, commercially pure, \$5.25-\$6.35; billets, HR, commercially pure, \$4.10-\$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)
Antimony, American, Laredo, Tex. 29.50
Beryllium aluminum 5% Be, Dollar 74.75
Beryllium copper, per lb conta'd Be 343.00
Beryllium 97% lump or beads, 6.0b. Cleveland Reading 571.50
Blismuth, ton lots \$2.25
Cadium, 98.9% small lots \$1.55
Calcium, 99.8% metallic basis. \$1.55
Chromium, 99.8% metallic basis. \$1.55
Chromium, 99.8% metallic basis. \$1.55
Cobalt, 97.99% (per lb) ... \$2.00 to \$2.07
Germanium, per gm, f.ob. Miami.
Okla, refined ... 95.50 to 50.00
Gold, U. S. Treas, per troy oz. \$35.00
Indium, 99.9%, dollars per troy oz. \$2.51
Iridium, dollars per troy oz. \$70 to \$80.11
Lithium, 98% ... \$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb. ... 55.00
Mercury, dollars per 76-lb flask.
f.ob. New York ... \$228 to \$231
Nickel oxide sinter at Cooper
Cliff. Ont. contained nickel 71.25
Paliadium, dollars per troy oz. \$62 to \$70
Rhodium \$120.00 to \$2.50
Silver ingots (¢ per troy oz.) 88.625
Thorium, per kg. \$43.00
Vanadium \$3.46.
Zirconium sponge \$5.00 (Cents per lb unless otherwise noted)

Remelted Metals

				1	B	r	a	8	8			H	9	0	Ŧ									
(Cents	8	90	6	r	1	b	1	d	e	u	27	e	9	81	d		c	a	9"	le	26	20	de	()
85-5-5 inge	ot																							
No. 115																								27.00
No. 120																								26.25
No. 123					0	0			0	0	0								0					25.75
80-10-10 ir	18	30	ř																					
No. 305						0			0			٠		۰					0					31.25
No. 315																								29.25
88-10-2 ing	C	Ě																						
No. 210		*		*				*							,	4		*	×				*	38.25
No. 215	*	*	*	*	*	*		×	*	*	*		5		*		8	*		×		8		34.00
No. 245					*	*		×	*		*			×		×	10	×	×	*	×	×	*	30.75
Yellow ing																								
No. 405										*	*	×	×	1					*	×		*		22.75
Manganese																								
No. 421		×	*	*	*	*	×		*	*	*	*	*	*	×	*		×	*	*			*	24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)	
95-5 aluminum-silicon alloys	
0.30 copper max24.00-24.2	25
0.60 copper max23.75-24.0	
Piston alloys (No. 122 type) 23.25-24.2	
No. 12 alum. (No. 2 grade) 21.00-21.7	5
108 alloy	
195 alloy	
13 alloy (0.60 copper max.) 23.75-24.0	
AXS-679 (1 pet gipe)	15

(Effective June 23, 1958)

Steel deoxidizing aluminum notch bar granulated or shot

Grade	1-95-97%	96									. 22.00-23.50
								0	0		.21.00-21.75
	3-90-92%		0	0	0	0	0	9		0,	.20.00-20.75
Grade	4-85-90%			×		×	×				.17.00-18.00

SCRAP METALS

Brass Mill Scrap

shipments											
									Hes	LVY	Turnings
Copper		0	0	0	0	0	0	0	21		20 1/4
Yellow brass	٠					٠			16	36	1436
Red brass									18	56	1734
Comm. bronze									19	14	1814
Mang. bronze									.14	%	141/4
Yellow brass	r	0	d		e	n	d	8	15	36	

Customs Smelters Scrap

(Cents per pound carload lots	, delivered
No. 1 copper wire	22
No. 2 copper wire	20 1/2
Light copper	1814
Refinery brass	20 1/2
*Dry copper content.	13 78

Ingot Makers Scrap

No. 1 copper wire	22
No. 2 copper wire	20 1/4
Light copper	18 %
No. 1 composition	19
No. 1 comp. turnings	183
Hvy. yellow brass solids	131/
Brass pipe	14%
Radiators	15 %
Aluminum	
Mived old cast	2 -13

Dealers' Scrap
(Dealers' buying price f.o.b. New York
in cents per pound)

Copper and Brass

No. 1 copper wire 20	1/2-21
No. 2 copper wire 18	1/2-19
Light copper 16	1/2-17
Auto radiators (unsweated). 12	1/2-13
No. 1 composition 16	1/2-17
No. 1 composition turnings 15	1/2-16
Cocks and faucets 13	1/2-14
Clean heavy yellow brass 11	72-12
Brass pipe	1/2-14
New soft brass clippings 14	14 -19
No. 1 brass rod turnings 11	78 -14

Aluminum

Alum. pistons and struts	6 - 614
Aluminum crankcases	9 - 9 10
1100 (28) aluminum clippings	121/2-13
Old sheet and utensils	9 - 9 1/4
Borings and turnings	6 - 6%
Industrial castings	9 - 9 1/2
2024 (248) clippings	10 1/2 11
WI	

New zinc cli	ppings			6.6			4 -	377
Old zinc							3 -	3 16
Zine routing							1%-	2
Old die cast	scrap					**	11/9-	1.%
1	Nickel	Q8	d	M	le	nel		
Pure nickel	clippi	ng	8					2-45
Clean nickel	fuen	71.03					3	7-40

Clean nickel turnings Nickel anodes Nickel rod ends New Monel clippings Clean Monel turnings Old sheet Monel Nickel silver clippings, mixed Nickel silver turnings, mixed.

Lend

		_								
Soft scrap lead Battery plates Batteries, acid	(dry)			*	*		*	. 2	%= %=	2
M	liscella	m	ie	10	21	##	ŝ			

Block tin No. 1 pewter Auto babbitt Mixer common babbitt Solder joints Siphon tops Small foundry type Monetymes Monotype Lino, and stereotype

1	RON AGE		Italics id	entify produc	ers listed in	key at end o	f table. Bass	prices, f.o.b	. mill, in cent	per lb., unless	otherwise n	oted. Extra	apply.				
	STEEL	BILLE	TS, BLC SLABS	OOMS,	PIL- ING	STI	SHAPES RUCTUR		STRIP								
F	PRICES	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Stee I	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hut- rolled	Cold- ralled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled			
	Bethlehem, Pa.			\$114.00 B3		5.325 B3	7.80 B3	5.325 B3									
	Buffalo, N. Y.	\$77.50 R3, B3	\$96.00 R3, B3	\$114.00 R3.	6.225 B3	5.325 B3	7.80 B3	5.325 B3	4.925 R3, B3	7.15 S10	7.325 <i>B</i> 3						
	Phila., Pa.					-				7.70 P15							
	Harrison, N. J.													15.05 C			
	Conshohecken, Pa.		\$101.00 /12	\$121.00 .42					4.975 A2		7.325 A2						
	New Bedford, Mass.									7.60 R6							
EAST	Johnstown, Pa.	\$77.50 B3	\$96.00 B3	\$114.00 B3		5.325 B3	7 80 B3										
EA	Boston, Mass.									7.70 T8				15.40 7			
	New Havon, Conn.									7.60 D1							
	Baltimore, Md.									7.15 T8							
	Phoonixville, Pa.					5.325 P2		5.325 P2									
	Sparrows Pt., Md.								4.925 B3		7.325 B3						
	New Britain, Bridgeport, Wallingford, Conn.			\$114.00 N8						7.60 W1,S7							
	Pawtucket, R. I.									7.70 N7				15.40 N			
_	Worcester, Mass.									7.70 A5				15.20 T			
	Alton, III.								5.125 <i>L1</i>								
	Ashland, Ky.		******						4.925 A7	218.04		10.45.04		14.00.0			
	Canton-Massillon, Dover, Ohio Chicago, III.	\$77.50 UI.	\$98,50 R3 \$96.00 U1,	\$114.00 R3, T5	6.225 UI	5.275 UI,	7.75 UI, YI	5 975 [/]	4.925 W8,	7.15 G4 7.25 A1, T8		10.45 G4	8.10 W8,	14.85 C			
	Franklin Park, III. Evanston, III.	R3	R3,W8	R3,W8	6.223 07	W8.P13	W8	321301	N4,AI	M8			S9,13	S9,G4			
	Cleveland, Ohio									7.15 A5,J3		10.45 A5	8.10 /3				
	Detroit, Mich.			\$114.00 R5					4 925 G3, M2	7.15 M2,D1, D2,G3,P11	7.325 G3	10.60 D2 10.50 G3	8.10 G3	15.05 G.			
-	Anderson, Ind.									7.15 G4							
WEST	Duluth, Minn.																
MIDDLE	Gary, Ind. Harbor, Indiana	\$77.50 UI	\$96.00 UI	\$114.00 UI. YI		5.275 UI, 13	7.75 UI. 13	5.275 13	4.925 U1, 13, Y1	7.15 Y/	7.325 UI, 13, YI	10.60 Y/	8.10 UI+ YI				
M	Sterling, Ill.	\$77.50 N4				5.275 N4			5.025 N4								
	Indianapolis, Ind.									7.30 /3				15.20 J			
	Newport, &y.												8.10 //9				
	Middletown, Ohio Niles, Warren, Ohio Sharon, Pa.		\$96.00 S1,	STEEM					4.925 R3,	7.15 R3,T4	7.325 R3,	10.50 SI	8.10 SI	15.05 S			
	Owensboro, Ky.	\$77.50 G5	\$96.00 G5	C10,S1		-			SI	SI	SI	10.45 R3					
	Pittaburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	\$77.50 U1, P6	\$96.00 U1, C11,P6	\$114.00 G5 \$114.00 U1, C11,B7	6.225 UI	5.275 UI. J3	7.75 UI, J3	\$.275 U1	4.925 P6	7.15 <i>J</i> 3,84		-	8.10.59	15.05 S			
	Woirton, Wheeling, Follanshee, W. Va.				6,225W3	5.275 W3		5.275 W3	4.925 W3	7.15 W3,F3	7.325 W3	10.50 W3					
	Youngstown, Ohio	\$77.50 R3	\$96.00 Y1, C10	\$114.00 Y/			7.75 Y/			7.15 YI,J3	7.325 UI, YI	10.65 Y/	8.10 UI, YI	15.05 / 10.65 Y			
_	Fontana, Cal.	\$88.00 K1	\$105.50 KI	\$135.00 KI		6.975 K1	8.55 K1	6.225 K1	5.675 K1	9.00 KI							
	Geneva Utah		\$96.00 C7			5.275 C7	7.75 C7										
	Kansas City, Mo.					5.375 S2	7.85 S2						8.35 52				
	Los Angeles, Torrance, Cal.		\$105.50 B2	\$134.00 B2		5.975 C7,	8.45 B2		5.675 C7,	9.05 J3 9.20 CI			9.36 82	17.25 J			
WEST	Minnequa, Colo.					82 5.575 C6			6.025 C6	9.20 C/ 9.10 K/				-			
1	Portland, Ore.					6.025 02	-		6.923 C0	3.10 K/				-			
	San Francisco, Niles, Pittsburg, Cal.		\$105,50 B2			5.925 B2	8.40 B2		5.675 C7, B2								
	Seattle, Wash.		\$109.50 B2			6.025 B2	8.50 B2		5.925 B2								
_	Atlanta, Ga.					5.475 A8			4.925 A8								
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$77.50 T2	\$96.00 T2			5.275 T2, R1,C16	7.75 72		4.925 T2, R3,C16		7.325 T2			-			
36	Houston, Lone Star,		**** ** **	\$119.00 S2		5.375 S2	7.85 S2				-		8.35 S2	-			

	IRON AGE									-			
	STEEL				SHE	ETS				WIRE	TINPI	PLATE	
-	PRICES	Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized	Enamel-	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
	Bethlebem, Pa.												
	Buffalo, N. Y.	4.925 B3	6.05 B3				7.275 B3	8.975 B3		6.15 W6	† Special co	ated mfg.	
	Claymont, Del.										terne deduct 1.25-lb. coke	base box	+50
	Coatesville, Pa.										blackplate 55 deduct \$2.20	aking quality to 128 lb. from 1.25 lb.	
	Conshohocken, Pa.	4.975 A2	6.10 A2		7.3		7.325 //2				* COKES:	N.	
	Harrisburg, Pa.										edd 25c. ELECTRO:	0.50-lb. add	
ST	Hartford, Conn.										25¢; 0.75-lb. 1.00-lb. add	\$1.00. Differ-	
EAST	Johnstown, Pa.									6.15 B3	ential 1.00 lb add 65¢.	./U.Z5 Ib.	
	Fairless, Pa.	4.975 UI	6.10 UI				7.325 UI	9.025 UI			\$10.15 UI	\$8.85 UI	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 B3	6.65 83	6.60 B3			7.275 B3	8.975 B3	9.725 B3	6.25 B3	\$10.15 B3	\$8.85 B3	
	Worcester, Mass.									6.45 A5			
	Trenton, N. J.												
	Alten, III.									6.35 L1			
	Ashland, Ky	4.925 A7		6.68 .47	6.625 A7								
	Canton-Massillon, Dover, Ohio			6.60 R3, R1									
	Chicago, Joliet, III.	4.925 W8, Al					7.275 UI			6.15 A5, R3,W8, N4, K2			
	Sterling, Ill.									6.25 N4, K2			
	Cleveland, Ohio	4.925 R3, J3	6.05 R3, J3		6.625 R3		7.275 R3,	8.975 R3,		6.15 A5			
i	Detroit, Mich.	4.925 G3, M2	6.05 G3 M2				7.275 G3	8.975 G3					
-	Newport, Ky	4.925 A1	6.05 AI										
E WEST	Gary, Ind. Harbor, Indiana	4.925 U1, 13,Y1	6.05 U1, 13, Y1	6.60 UI, 13	6.625 UI, 13, YI	7.00 UI	7.275 U1, Y1,13	8.975 UI, YI		6.15 Y/	\$10.05 UI, YI	\$8.75 <i>13</i> , <i>UI</i> , <i>YI</i>	7.50 U1, Y1
MIDDLE	Granite City, III.	5.025 G2	6.15 G2	6.70 G2	6.725 G2							\$8.85 G2	7.60 G2
M	Kokomo, Ind.			6.70 C9						6.25 C9			
	Mansfield, Ohio		6.05 E2			7.00 E2							
	Middletewn, Ohio		6.05 A7	6.60 A7	6.625 A7	7.00 A7							
	Niles, Warren, Ohio Sharen, Pa.	4.925 R3. N3,S1	6.05 R3	6.69 A3	6.625 N3, SI	7.00 N3, SI,R3	7.275 R3	8.975 SI, R3				\$8.75 R3	
	Pittaburgh, Pa. Midland, Pa. Butler, Pa. Denora, Pa. Aliquippa, Pa.	4.925 UI. J3,P6	6.05 U1, J3,P6	6.60 UI, J3	6.625 UI		7.275 UI, J3	8.975 UI, J3	9.725 UI	6.15 A5, J3,P6	\$10.05 UI, J3	\$8.75 UI. J3	7.50 UI. J3
	Portamouth, Ohio	4.925 P7	6.05 P7	-				-		6.15 P7			
	Weirton, Wheeling, Follanshee, W. Va.	4.925 W3.	6.05 W3,	6.60 W3,		7.00 W3, W5	7.275 W3	8.975-19'3			\$10.05 W5,	\$8.75 W5,	7.50 W5
	Follanshee, W. Va.	4.925 UI, YI	F3,W5 6.05 Y1	11/3	6.625 Y/	11/3	7.275 YI	8.975 Y/		6.15 Y/	W3		
	Fontana Cal.	5.675 K1	7.30 K1				8.025 K1	10.275 K1			\$10.80 KI	\$9.50 K1	
	Geneva, Utah	5.825 C7											
	Kansas City, Mo.									6.40 S2			
WEST	Los Angeles, Torrance, Cal.									6.95 B2			
	Minnequa, Colo.	8.69F.C2	7.00 (72	2.35 (2	-	-		-		6.40 C6	\$10.50 (7)	\$9.50 C7	
	San Francisco, Nilos, Pittsburgh, Cal. Seattle, Wash.	5.625 C7	7.00 C7	7.35 C7			-			6.95 C7	\$10.80 C7	,,,,,, c,	
_	Atlanta, Ga.												
SOUTH	Fairfield, Ala. Alabama City, Ala.	4.925 T2, R3	6.05 T2, R3	6.60 T2, R3	6.625 72					6.15 T2, R3	\$10.15 T2	\$8.85 72	
S	Houston, Tex.									6.40.52			

	IRON AGE				l in key at end o							
	STEEL			ВА	RS				PLA	TES		WIRE
1	PRICES	Carbon† Steel	Reinforc-	Cold Finished	Alloy Hot- rolled	Allay Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mirs'. Bright
	Bethlehem, Pa.				6.475 B3	8.775 B3	7.925 B3					
	Buffalo, N. Y.	5.425 R3, B3	\$.425 R3,B3	7.35 B5	6.475 B3,R3	8.775 B3,B5	7.925 B3	5.10 B3		7.20 B3		7.65 W6
	Claymont, Del.							5.10 C4		7.28 C4	7.625 C4	
	Coatesville, Pa.							5.10 L4		7.20 L4	7.625 L4	
	Conshohocken, Pa.							5.10 42	6.175 A2	7.20 A2	7.625 A2	
	Harrisburg, Pa.							5.10 P2	6.275 P2			
	Milton, Pa.	5.575 M7	5.575 M7									
jes	Hartford, Conn.			7.80 R3		9.075 R3	7.925 B3					
EAST	Johnstown, Pa.	5.425 B3	5.425 B3		6.475 B3			5.10 B3		7.20 B3	7.625 B3	7.65 B3
	Fairless, Pa.	5.575 UI	5.575 UI		6.625 UI							
	Newark, N. J. Camdon, N. J.			7.75 W10		8.95 W10						
	Camdon, N. J. Bridgeport, Conn. Putnam, Conn.			7.75 P10 7.85 W10 7.80 J3	6.55 N8	8.95 P10 8.925 N8						
	Willimentic, Conn.											
	Sparrows Pt., Md.		5.425 B3					\$.10 B3		7.28 B3	7.625 B3	7.75 B3
	Palmer, Worcester, Roadville, Mass. Mansfield, Mass.			7.85 B5,C14		9.075 A5,B5						7.95 A5, W6
	Spring City, Pa.			7.75 K4		8.95 K4						
	Alton, III.	5.628 L1										7.85 L1
	Ashland, Newport, Ky.							5.10 A7, A1		7.20 Al		
	Canton, Massillon, Obio	5.90° R3		7.30 R3,R2	6.478 R3, T5	8.775 R3,R2, T3						
	Chicago, Joliet, Waukegan, III. Harvey, III.	\$.42\$ U1,R3, W8,N4,P13	\$.42\$ U1,R3, N4,P13	7.30 A5. W10.W8 B5, L2,N9	6.475 UI, R3, W8	8.77\$ A5, W10,W8 L2,N8,B5	7.925 UI,W8	5.10 UI, AI, W8, I3	6.175 UI	7.20 UI,W8	7.625 U1,W8	7.65 A5,1 W8,N4, K2,W7
	Cleveland, Ohio Elyria, Ohio	5.425 R3	5.425 R3	7.30 A5,C13 C18		8.775 A5, C13, C18	7.925 R3	5.20 R3, J3	6.175 /3		7.625 R3, J3	7.65 A5, C13
	Detroit, Mich.	5.425 G3	5.425 G3	7.55 P3 7.50 P8,85	G3 G3	8.775 R5 8.975 B5,P3, P8	7.925 G3	5.10G3		7.20 G3	7.625 G3	
22	Duluth, Minn.											7.65 A5
ALE WEST	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	S.425 U1,13, Y1	\$.425 U1,13, Y1	7.30 R3, J3	6.475 U1,13, Y1	8.775 R3,M4	7.928 UI. YI	5.10 UI.13, YI	6.175 <i>J</i> 3, <i>I</i> 3	7.28 UI, YI	7.625 UI. YI.13	7.75 MH
MIDDLE	Granite City, III.							5.20 G2	-			
-	Kokome, Ind.		5.525 C9									7.75 C9
	Sterling, III.	S.S2S N4	\$.525 N4					5.10 N4				7.75 K2
	Niles, Warren, Ohio			7.30 C/0	6.478 C10,S1	8.775 C10	7.925 SI	5.10 R3,S1		7.20 SI	7.625 R3,	
	Sharon, Pa.										SI	
	Owenshare, Ky. Pittsburgh, Midland, Danera, Aliquippa, Pa.	5.425 G5 5.425 U1, J3	\$.42\$ U1,J3	7.30 A5,84, R3,J3,C11,	6.475 G5 6.475 U1, J3, C11, B2	8.778 A5, W10,R3,S9,	7.925 U1, J3	5.10 UI, J3	6.178 UI	7.20 UI, J3, B7	7.625 U1, J3, B7	7.65 A5, J3,P6
				W10,59,C8		CII,CB						
	Portsmouth, Ohio							E 10 14/4				7.65 P7
	Weirton, Wheeling, Follanshee, W. Va.							5.10 W5				
	Youngstown, Ohio	5.425 UI, R3, YI	\$.425 U1, R3, Y1	7.30 A5,YI, F2	6.475 UI, YI	8.775 Y1,F2	7.925 UI, YI	5.10 UI, R3, YI		7.20 YI	7.625 UI. R3, Y1	7.65 Y/
	Emeryville, Cal. Fontana, Cal.	6.175 /5 6.125 K/	6.175 /5 6.125 K/		7.525 KI		8.625 K/	5.90 KI		8.00 KI	8.425 K1	
	Geneva, Utah							\$.10 C7			7.625 C7	
	Kansas City, Me.	5.475.52	5.675 S2		6.725 SZ		8.175 S2					7.90 S2
ST	Los Angeles, Terrance, Cal.	6.125 C7,B2	6.125 C7,B2	8.75 R3,P14	7.525 B2	10.75 P14	8.625 B2				*	8.60 B2
WEST	Minnequa, Colo.	5.875 C6	5.875 C6					5.95 C6				7.90 C6
	Pertland, Ora.	6.175 02	6.175 02									
	San Francisco, Niles, Pittaburg, Cal	6.125 C7 6.175 B2	6.125 C7 6.175 B2				8.675 B2	100.75				8.60 C7.0
_	Seattle Wash.	6.175 B2,N6	6.175 B2				8.675 B2	6.00 B2		8.10 B2	8.525 B2	
SOUTH	Atlanta, Ga. Fairfield, Ala. City, Birmingham, Ala.	5.425 T2,R3, C/6	\$.425 A8 \$.425 T2,R3, C16	7.98 C16			7.925 T2	5.10 T2,R3			7.625 T2	7.65 A8 7.65 T2,8
6	Houston, Ft. Worth,	5.475.52	5.675 S2		6.725 S2	-	8.175 S2	5.20 S2		7.30 S2	7.725 SZ	7.90 52

STEEL PRICES

Key to Steel Producers

With Principal Offices

Al Acme Steel Co., Chicago

A2 Alan Wood Steel Co., Conshohocken, Pa.

Allegheny Ludlum Steel Corp., Pittsburgh A3

American Cladmetals Co., Carnegie, Pa.

American Steel & Wire Div., Cleveland Angel Nail & Chaplet Co., Cleveland 45

46

Armco Steel Corp., Middletown, Ohio 48

Atlantic Steel Co., Atlanta, Ga. Acme-Newport Steel Co., Newport, Ky. 19

RI Babcock & Wilcox Tube Div., Beaver Falls, Pa.

R2 Bethlehem Pacific Coast Steel Corp., San Francisco

Bethlehem Steel Co., Bethlehem, Pa. 83

Blair Strip Steel Co., New Castle, Pa. BS.

Bliss & Laughlin, Inc., Harvey, Ill. 266 Brook Plant, Wickwire-Spencer Steel Div.,

Birdsboro, Pa.

B7 A. M. Byers, Pittsburgh

Braeburn Alloy Steel Corp., Braeburn, Pa.

CI Calstrip Steel Corp., Los Angeles

Carpenter Steel Co., Reading, Pa.

C3 Central Iron & Steel Co., Harrisburg, Pa.

Claymont Products Dept., Claymont, Del. Cá

Ci Colorado Fuel & Iron Corp., Denver C7

Columbia Geneva Steel Div., San Francisco CB

Columbia Steel & Shafting Co., Pittsburgh

Continental Steel Corp., Kokomo, Ind. C

C10 Copperweld Steel Co., Pittsburgh, Pa.

C11 Crucible Steel Co. of America, Pittsburgh C13 Cuyahoga Steel & Wire Co., Cleveland

C14 Compressed Steel Shafting Co., Readville, Mass.

C15 G. O. Carlson, Inc., Thorndale, Pa.

C16 Connors Steel Div., Birmingham

C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

Detroit Steel Corp., Detroit

Dearborn Div., Sharon Steel Corp. D2 D3

Driver Harris Co., Harrison, N. J. Dickson Weatherproof Nail Co., Evanston, Ill. D4

Eastern Stainless Steel Corp., Baltimore

E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.

Fitzaimons Steel Corp., Youngstown

F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.

G3 Great Lakes Steel Corp., Detroit

G4 Greer Steel Co., Dover, O.

G5 Green River Steel Corp., Owenboro, Ky:

HI Hanna Furnace Corp., Detroit

12 Ingersoll Steel Div., Chicago

13 Inland Steel Co., Chicago 14 Interlake Iron Corp., Cleveland

JI Jackson Iron & Steel Co., Jackson, O.

Jessop Steel Corp., Washington, Pa.

J3 Jones & Laughlin Steel Corp., Pittsburgh

J4 Joslyn Mfg. & Supply Co., Chicago

J5 Judson Steel Corp., Emeryville, Calif.

KI Kaiser Steel Corp., Fontana, Cal.

K2 Keystone Steel & Wire Co., Peoria

K3 Koppers Co., Granite City, Ill.

K4 Keystone Drawn Steel Co., Spring City, Pa.

LI Laclede Steel Co., St. Louis

L2 La Salle Steel Co., Chicago

L3 Lone Star Steel Co., Dallas L4 Lukena Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.

M2 McLouth Steel Corp., Detroit

M3 Mercer Tube & Mfg. Co., Sharon, Pa.

M4 Mid States Steel & Wire Co., Crawfordsville, Ind.

M6 Mystic Iron Works, Everett, Mass.

M7 Milton Steel Products Div., Milton, Pa.

M8 Mill Strip Products Co., Evanston, Ill.

NI National Supply Co., Pittsburgh

N2 National Tube Div., Pittaburgh

N3 Niles Rolling Mill Div., Niles, O.

No Northwestern Steel & Wire Co., Sterling, Ill.

N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

N8 Carpenter Steel of New England, Inc.,

Bridgeport, Conn

N9 Nelson Steel & Wire Co.

01 Oliver Iron & Steel Co., Pittsburgh

02 Oregon Steel Mills, Portland

PI Page Steel & Wire Div., Monessen, Pa.

P2 Phoenix Iron & Steel Co., Phoenixville, Pa.

P3 Pilgrim Drawn Steel Div., Plymouth, Mich.

P4 Pittsburgh Coke & Chemical Co., Pittsburgh P5 Pittsburgh Screw & Bolt Co., Pittsburgh

P6 Pittsburgh Steel Co., Pittsburgh

P7 Portsmouth Div., Detroit Steel Corp., Detroit

FI Plymouth Steel Co., Detroit

Pacific States Steel Co., Niles, Cal.

FIO Precision Drawn Steel Co., Camden, N. J.

P11 Production Steel Strip Corp., Detroit P13 Phoenix Mfg. Co., Joliet, Ill.

P14 Pacific Tube Co.

P15 Philadelphia Steel and Wire Corp.

RI Reeves Steel & Mig. Co., Dover, O.

RI Reliance Div., Eaton Mfg. Co., Massillon, O.

AJ Republic Steel Corp., Cleveland

Re Roebling Sons Co., John A., Trenton, N. J.

R5 J. & L. Steel Co., Stainless Div.

R6 Rodney Metals, Inc., New Bedford, Mass.

#7 Rome Strip Steel Co., Rome, N. Y.

SI Sharon Steel Corp., Sharon, Pa.

S2 Sheffield Steel Div., Kansas City

S3 Shenango Furnace Co., Pittsburgh

S4 Simonds Saw and Steel Co., Fitchburg, Mass.

S5 Sweet's Steel Co., Williamsport, Pa.

S6 Standard Forging Corp., Chicago

S7 Stanley Works, New Britain, Conn.

5# Superior Drawn Steel Co., Monaca, Pa

59 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.

\$10 Seneca Steel Service, Buffalo

SII Southern Electric Steel Co., Birmingham

71 Tonawanda Iron Div., N. Tonawanda, N. Y.

77 Tennessee Coal & Iron Div., Fairfield

73 Tennessee Products & Chem. Corp., Nashville

74 Thomas Strip Div., Warren, O. 73 Timken Steel & Tube Div., Canton, O.

77 Texas Steel Co., Fort Worth

To Thompson Wire Co., Boston

Ul United States Steel Corp., Pittsburgh

U2 Universal Cyclops Steel Corp., Bridgeville, Pa.

U3 Ulbrich Stainless Steels, Wallingford, Conn.

U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.

W2 Washington Steel Corp., Washington, Pa.

W3 Weirton Steel Co., Weirton, W. Va. W4 Wheatland Tube Co., Wheatland, Pa

W'S Wheeling Steel Corp., Wheeling, W. Va.

W6 Wickwire Spencer Steel Div., Buffalo W7 Wilson Steel & Wire Co., Chicago

W/N Wisconsin Steel Div., S. Chicago, III.

Wy Woodward Iron Co., Woodward, Ala.

W10 Wyckoff Steel Co., Pittaburgh W12 Wallace Barnes Steel Div., Bristol, Conn.

YI Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (act) f.o.b. mills. Base price about \$200 per net ton.

							BUT	TWELD										SEAN	ALESS			
	3/2	In. ¾ In.		1 in.		134	1¼ In.		1½ In.		In. 23		2½-3 In.		In.	23/2 In.		3 In.		33/6	-4 ln.	
STANDARD T. & C.	Bik.	Gal	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal
Sparrows Pt. B3 Youngstown R3 Fontana K1 Pittaburgh J3	5.25 +8.25 5.25	+23.5 +10.0	8.25	+8.0 +6.0 +19.5 +6.0	11.75	+1.50	12.25 14.25 0.75 14.25	+0.75	12.78 14.75 1.25 14.75	0.25	15.25	0.75 +12.75	16.75	+13.00	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.30
Alton, Ill. £1 Sharon M3 Fairless N2 Pittsburgh N1 Wheeling W5	5,25		6.25 8.25 6.25 8.25 8.25	+8.0 +6.0 +8.0 +6.0 +6.0	9.75	+1.50 +3.50 +1.50	14.25	+0.75 +2.75 +0.75	12.75 14.75 12.75 14.75 14.75	0.25 +1.75 0.25	15.25 13.25 15.25	0.75 +1.25 0.75	14.75 16.75 14.75 16.75 16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	
Wheatland W4 Youngstown Y1 Indiana Harbor Y1 Lerain N2	5.25 5.25 4.25	+10.0 +10.0 +11.0 +10.0	8.25 8.25 7.25	+6.0 +6.0 +7.0	11.75 11.75 10.75	+1.50 +1.50 +2.50	14.25 14.25 13.25	+0.75 +0.75 +1.75	14.75 14.75 13.25	0.25 0.25 +0.75	15.25 15.25 14.25	0.75 0.75 +0.25	16.75 16.75	0.50 0.50 +1.00 0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50 +15.50
PLAIN ENDS Sparrows Pt. B3 Youngstown R3 Pairless N2	7.75 9.75 7.75	+4.0	13.75 11.75		16.75	2.50 4.50 2.50	17.25	3.25 1.25	17.75	4.25 2.25	18.25 16.25	4.75	16.75 18.75 16.75	3.50								
Postana KI Pittaburgh J3 Alton, Ill. LI Sharon M3 Pittaburgh NI	+3.75 9.75 7.75 9.75 9.75	+4.0	11.75 13.75 13.75	list list	3.25 16.75 14.75 16.75 16.75	4.50 2.50 4.50 4.50	15.25 17.25 17.25	3.25 1.25 3.25 3.25	15.75 17.75 17.79	4.25 2.25 4.25 4.25	16.25 18.25 18.25	4.75 2.75 4.75 4.75	5.25 18.75 16.75 18.75 18.75	1.50 3.50 3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling W5 Wheatland W4 Yeungstown Y1 Indiana Harbor Y1 Lorsin N2	9.75 9.75 9.75 8.75 9.75	+4.0 +4.0 +5.0	13.75 13.75	list list +1.0	16.75 16.75 16.75 15.75 16.75	4.50 4.50 3.50	17.25 16.25	3.25	17.75	4.25 4.25 3.25	18.25 18.25 17.25	4.75 4.75 3.75	18.75 18.75 18.75 17.75 18.75	2.50	*7.75	+21.75	+0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on sinc price range of ever 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in sinc, discounts vary as follows: 3½, ¾ and 1-in., 2 pt.; 1½, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., sinc price range of ever 13¢ to 15¢ would lower d'acounts on 2½ and 3-in. pipe by 2 points; tinc price in range ever 7¢ to 9¢ would increase discounts.

East St. Louis sinc price now 10¢ per lb.

METAL POWDERS

METAL POWDERS
Per pound, f.o.b. shipping point, in ton
lots for minus 100 mesh
Swedish sponge iron, del. East of
Miss. River, ocean bags, 23,000
lb. and over
F.O.D. Riverton of Camuen, New
Jersey, west of Miss. River 9.5¢
Domestic sponge iron, 98+% Fe,
23,000 lb. and over del'd East
Jersey, west of Miss. River 9.5¢ Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River 10.5¢ F.O.B. Riverton, New Jersey, West of Miss. River 9.5¢ Canadian sponge iron, del'd in East, carloads 10.5¢
of Mice Diver
Canadian spange from del'd in
East carloads 10.5¢
Atomized iron powder, 98% + Fe. 40
Atomized iron powder, 98% + Fe, 40 mesh., F.O.B. Easton, Pa., in 100 lb
bags7.7¢
bags
Easton, Pa., in 100 lb. bags. Freight allowed east of Miss. River10.5¢
allowed east of Miss. River10.5¢
Atomized Iron powder, 98% + Fe. Cutting
Atomized Iron powder, 98% + Fe. Cutting and scarfing grade, F.O.B. Easton, Pa
Pa
Electrolytic iron, annealed, imported 99.5+% Fe 27.5¢
imported 99.5 + % Fe 21.5¢
Electrolytic iron, annealed, imported 99.5+% Fe
minus 325 mach 39 1 % Fo 57 04
Electrolytic iron melting
stock 99.84% pure 27.04
Carbonyl iron size 3 to 20
micron, 98%, 99.8+% Fe., 88.0¢ to \$2.85
Aluminum, freight allowed 38.00¢ Brass, 10 ton lots
Brass, 10 ton lots31.1¢ to 47.1¢
Copper, electrolytic 41.50¢
Copper, reduced
Cadmium, 100-199 lb. 95¢ plus metal value
Chromium, electrolytic, 99.85%
min. Fe. 03 max. Del'd \$5.00
Lead, Lo.b. Hammond, Ind 19¢
Chromium, electrolytic, 99.85% 5.00 min. Fe. 93 max. Del'd \$5.00 Lead, f.o.b. Hammond, Ind. 19¢ Manganese f.o.b. Extron, Pa. 46.0¢ Molybdenum, 99% \$3.60 to \$3.35
Michael chamiantly provinted at 05
Nickel, chemically precipitated \$1.05 Nickel, unannealed \$1.06 Nickel, annealed \$1.06 Nickel, spherical, unannealed \$1.13 \$1.13 Silicon \$43.50¢
Nickel appealed \$1.00
Nickel spherical upappealed
#80 #1 12
Silicon 43 504
Solder powder13¢ plus met. value
Stainless steel 302
Stainless steel, 302 \$1.02 Stainless steel, 316 \$1.30
Tin14.00¢ plus metal value
Tungsten, 99% (65 mesh) \$3.15 (nominal)
Zinc, 5000 lb & over17.5¢ to 30.7¢
Zinc, 5000 10 & over11.5¢ to 50.1¢

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill) Pct. Discounts

Machine and Carriage Bolts	Full Con- tainer Price	SO Con- tainers	20,000 Lb.	40,000 Lb.
%" and smaller x 6" and shorter	49	54	56	87
%" thru 1" x longer than 6"	3.5	40	43	45
Rolled thread carriage bolts 1/2" & smaller x 6" and shorter	40	54	56	57
Lag, all diam. x 6" &	40	54	56	57
Lag, all diam. longer than 6 in.	39	4434	47	4836
Plow bolts, 1/2" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy. Full case o	r
% in. or smaller 60 ½ % in. to 1 in. inclusive 55 ½ 1 ½ in. to 1 ½ in. inclusive 58 ½ 1 ½ in. and larger 53 ½	44
C. P. Hex, reg. & hvy.	
$\frac{5}{4}$ in. and smaller	ž
Hot Galv. Hex Nuts (All Types)	
% in. and smaller 463	6
Semi-finished Hex Nuts	
\(\frac{\pi_0}{\pi_0} \) in, or smaller	4
Finished % in. and smaller 63	
Rivets	
Base per 100 l	
½ in. and larger	it

Cap Screws Discount (Packages)

Full Finished H.	C. Heat Treat
New std. hex head, pack-	
aged	
%" diam. and smaller x	
	0 26
34", %", and 1" diam, x	
%", %", and 1" diam. x 6" and shorter 2	2 3
%" diam. and smaller x	
longer than 6"	8 +13
%", %", and 1" diam. x	
longer than 6"+	6 +32
ranger toma t	C-1018 Steel
	Full-Finished
	Cartons Bulk
1/ ff Alemanach N/ ff alle m Rff	

Machine Screws & Stove Bolts

		Disco	unt
Plain Finish Cartons Bulk	Quantity	Mach. Screws 60	Stove Bolts 60
To ¼" diam. incl.	25,000-and over	60	
5/16 to %" diam. incl.	15,000-200,000	60	

Machine Screws & Stove Bolt Nuts

		Dia	count
In Cartons	Quantity	Hex 16	Square 19
In Bulk			
diam. &	25,000 and over	14	16

ELECTROPLATING SUPPLIES

Anodes	
(Cents per lb, frt allowed in quant	ity)
Electrodeposited	10.00 31.25 44.00 16.00
(Rolled depolarized add 3¢ per lb Cadmium Tin, ball anodes \$1.13 per lb (approx	1.55
Chemicals	
(Cents per lb, f.o.b. shipping point	
Copper cyanide, 100 lb drum (Copper sulphate, 100 lb bags, per	
Nickel salts, single, 100 lb bags	$\frac{22.15}{40.50}$
Nickel chloride, freight allowed, 300 lb	48.50
N. Y., 200 lb drums	24.05
Zinc cyanide, 100 lb Potassium cyanide, 100 lb drum	60.75
N. Y. Chromic acid, flake type, 10,000 lb	48.00
or more	31.00

CAST IRON WATER PIPE INDEX

CASI INC	17			۳	¥	P	•	8	ı	3	2.0	k.	٠					•	1	,,,	4	DEV
Birmingham																					0	125.8
New York		٠					۰			٠	٠	۰	٥	۰	0	٠		0		٠	٠	138.7
Chicago												0		0			۰	۰		۰	۰	140.9
San Francisc	0	-]	L.		Α	k.			0			,	۰				0	0				148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Ex-planation: p. 57, Sept. 1, 1955, issue, Source: U. S. Pipe and Foundry Co.

WARE-								Metro	politan l	Price, del	lara per	100 fb.
HOUSES		Sheets		Strip	Plates	Shapes	Bara		Alloy Bars			
Cities City Delivery Charge	Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)??	Hat-Rolled		Standard	Hot-Ralled (merchant)	Cold- Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4148 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta	8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68		1,511,121	1117713	
Baltimore\$.10	8.10	9.00	9.78	8.80	8.76	8.60	8.75	10.69*	16.28	15.28	19.83	19.08
Birmingham15	8.18	9,45	10.15	8.23	8,56	8.64	8.60	10.57				
Beston	9.48	10.54	11.55	9.52	9.82	9,73	9.83	13.00	16.38	15.38	19.93	19,18
Buffalo	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.15*	16.34	15, 15	19.01	18.95
Chicago 15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18,60
Cincinnati15	8,49	9,65	10.25	8.69	9.68	9.33	9.07	9.46	15.61	15,11	18.96	18.91
Cleveland15	8.33	9.60	10.35	8,48	8.94	9.16	8.84	10.95*	15.89	14,89	19.29	18.69
Denver20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60
Detreit	8.58	9.85	10.60	8.73	9.06	9.33	9.65	9.30	15.46	15.06	18,81	18.86
Houston	7.10	8.05		7.25	8.05	7.25	7.20	11.10	16,20	15.25	19.65	18.95
Kansas City20	9.02	10.27	10 82	9.85	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	9.70**		12.10	8.90	8.85	8.70	8.75	12.10*	17.05	16,10	21.05	20.35
Memphis15	8.55	9.80		8,60	8,93	9.01	8.97	12 11*				
Milwauhee 15	8.48	9.73	10.38	8.51	8.84	9.80	8.88	9.18	15.93	14.93	19.48	18.73
Now York 18	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	16.19	15, 19	19.74	18.99
Narfolk 29	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia 18	8.10	9.00	10.02	8.79	8.87	8.60	8.75	11.61*	16.11	15.11	19.66	18.91
Pittsburgh15	8.33	9.60	10.60	8, 48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland	10.001	11.752	13.303	11.954	10.105	11,106	9.857	11.34°	18.50	17.45	20.75	20.25
San Francisco10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13, 10	17.05	16, 10	21.05	20.35
Seattle	9.95	11.15	12.20	10.00	9.70	9.80	10.10	14.05	17.15	16.35	20.65	20.15
Spokane15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05
St. Louis 15	8.60	9.94	10.61	8.74	9.08	9.25	9.12	9.56	16.16	15.16	19.71	18.96
St. Paul 15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81		15.41	******	19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. "*All sizes except 18 and 16 gage.

†† 10¢ sinc. ½ Deduct for country delivery. *C1018—1 ln. rounds. ¹ 10 ga. x 36" x 120"; ² 20 ga. x 36" x 120"; ² 20 ga. x 36" x 120"; ² 36 ga. x 36" x 570" in lots of 1000 to 9999; ³ 3 heared plate ¼" x 84" in lots of 1000 to 9999; ³ 3" x 5.70" in lots of 1000 to 9999; ¹ M-1020—1-in. rounds in lots of 1000 to 9999.

TOOL STEEL

F.o.b	. mill					
W	Cr	V	Mo	Co	per lb	SAE
18	4	1	-	-	\$1.795	T-1
18	4	1	_	5	2.50	T-4
18	4	2	-	_	1.96	T-2
1.5	4	1.5	8	-	1.155	M-1
6	4	3	6	-	1.545	M-3
6	4	2	5	_	1.30	M-2
High	-carbo	on chi	romiu	m	.925 I	0-3, D-5
Oil 1	narder	ned m	angai	nese	.475	0-2
Spec	ial ca	rbon			.36	W-1
	a car				.36	W-1
Regu	lar ca	rbon			.305	W-1
					nd east	of Mis-
					igher. V	
	issippi					

C	s per lh f.a.b				
		Plate (A3, J2, I	Sheet (12)	
Cladding		10 pct	15 pct	20 pct	20 pct
	302				37.50
	304	37.95	42.25	46.70	40.00
2	316	44.40	49.50	\$4.50	58.75
a Ty	321	40.05	44,60	49.30	47.25
Stainless Type	347	42.40	47.55	52.88	57.00
Sta	485	29.85	33.35	36.85	*****
	410	29.55	33.10	36.70	*****
	430	29.80	33.55	37.25	

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std.	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Boits Untreated
Beasemer UI	5, 525	6.58	6.975				
Cleveland R3		-					14.75
Sa. Chiraga R3				9 75			
Ensley 72	5.525	6.50					
Fairfield T2		6.50		9.75		6.68	
Gary U1	5.525					6.60	
Huntington C/6		6.50					
Ind. Harbor 13.	5.525	-	6.975	9.75		6.60	
Ind. Harbor Y1.							
Johnstown B3.		6.50				0.001	
Jolist 1/1	3		6 975				
Kansas City S2 Lackawanna B3	1			9.75			14.75
Lackawanna B	5.525	6.50	6.975			6.60	
Lebanon B3			6.975		14.50		14.75
Minnegua C6	5.525	7.00	6.975	9.75		6.68	14.75
Pittsburgh P5.							14.75
Pittsburgh 13.	1			9.75			
Seattle B2				10.25		6.75	15.75
Steelton B3	5.525	å	6.975			6.60	
Struthers YI				9.75			0.00
Struthers YI Torrance C7						6.75	
Williamsport S!		6.50	0.000				
Youngstown R.	1			9.75			1000

COKE
Furnace, beehive (f.o.b.) Net-Ton
Connellsville, Pa \$15.00 to \$15.75
Foundry, beehive (f.o.b.)
\$17.50 to \$19.00
Foundry oven coke
Buffalo, del'd\$31.75
Detroit, f.o.b 30.50
New England, del'd 31.55
Kearney, N. J., f.o.b 29.75
Philadelphia, f.o.b 29.50
Swedeland, Pa., f.o.b 29.50
Painesville, Ohio, f.o.b 30.50
Erie, Pa., f.o.b 30.50
Cleveland, del'd 32.65
Cincinnati, del'd 31.84
St. Paul, f.o.b 29.75
St. Louis, f.o.b 31.50
Birmingham, f.o.b 28.85
Milwaukee, f.o.b 30.50
Neville Is Pa 99.95

LAKE SUPERIOR ORES

51.50% Fe natural content, lower Lake ports. Prices for 1958 Freight changes for seller's	account
Openhearth lump	1088 Tor
Old range, bessemer	
Old range, nonbessemer	11.70
Mesabi, bessemer	. 11.60
Mesabi, nonbessemer	11.43
High phosphorus	

ELECTRICAL SHEETS

22-Gage	Hot-Rolled	Cold-Reduced (Coiled or Cut Length)			
F.o.b. Mill Cents Per Lb	(Cut Lengths)*	Semi- Processed	Fully Processed		
Field	11.10	9.625	11.35		
Elect	11.80	11.55	12.05		
Special Motor		12.10			
Motor	12.90	12.65	13.15		
Dynamo	13.95	13.70	14.20		
Trans. 72	15.00	14.75	15.25		
Trans. 65	15.55		10.00		
		Grain ()riented		
Trans. 58	16.05	Trans. 66.	20 .20		
Trans. 52	17.10	Trans. 80 19.20 Trans. 73 19.70			

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2) \$2 a ton higher; Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (A9); Nilea, O. (N3); Vandergrift (UI); Warren, O. (R3); Zaneaville. Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

(GRAPHITE	3	CARBON*				
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price		
24 20 18 14 12 10 10 7 6 4 3 2½	84 72 72 72 72 72 69 48 69 49 49 49	26.00 25.25 25.75 25.75 26.25 28.00 28.50 28.25 31.50 35.00 37.00 39.25 60.75	48 35 30 24 28 17 14 12 10 8	100, 110 110 110 72 to 84 90 72 72 72 50 60	10,70 10,70 10,85 11,25 11,00 11,40 11,85 12,95 13,00 13,38		

• Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

rire City Brick	e.	wloads :	per 1000
First quality, Ill., Ky.,			
(except Salina, Pa.,			
No. 1 Ohio			
Sec. Quality, Pa., Md.,	Ky., A	10., Ill.	120.00
No. 2 Ohio			103.00
Ground fire clay, net			
(except Saling Pa	ndd	49 00 h	91 50

Silica Brick

Mt. Union, Pa., Ensley, Ala			. \$1	50.00
Childs, Hays, Pa			. 1	55.06
Chicago District			. 1	60,00
Western Utah			. 1	175.00
California				
Super Duty				
Hays, Pa., Athens, Tex., W	Tir	ıd		
ham, Warren, O., Morris				
1	57	.0	0-1	60.00
Silica cement, net ton, bulk, Lat	FC	b	9	28.50
Silica cement, net ton, bulk,				

Silica cement, net ton, bulk, Ens-	20.00
ley, Ala	26.50
Union	24.50
and Calif	37.00
Chrome Brick Per ne	t ton
Standard chemically bonded, Balt.\$ Standard chemically bonded, Curt-	
iner, Calif.	115.00
Burned, Balt	99.00

Magnesite Brick

Standard Baltimore Chemically bonded,	Bal	tin	ore	 \$131.00 116.00	
Grain Magnesite					

	stic, f.o.b			in bulk. Wash.,	\$73.00
Lun	ing. Nev				
in t	oulk	 	 		46.00
in s	acks	 	 	52.06	-54.00

Dead	Burn	ed l	Dole	omi	t	e				P	e	po.	net	ton
F.o.b.	bulk	pro	oduc	eing	7	p	ol	h	ts	ir	1:			
	W.													6.75
Mid	west						8						1	7.00
Mis	runa	Val	low										1	5.00

(Effective June 23, 1958)

MERCHANT WIRE PRODUCTS

	Standard Q Coated Nails	Woven Wire Feace	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
F.o.b. Mill	Col	Cul	Cul	Col	Col	¢/lb.	¢/lb.
Alabama City R3	173	187		212	193		9.20
Aliquippa J3***	173	190			190	8.65	9.325
Atlanta 4800	175	192		214	198	8.75	9.425
Bartonville K2**.		192	178	214	198		9.425**
Buffalu il 6							8.95"
Chicago Nar+o	173	198		212	196	8.65	9.325
Cleveland A6							
Cleveland 45						8.65	
Crawf'day. M4""	175	192			198	8.75	9.425
Donora, Pa. A5	179	187			193		9.20
Duluth A5	173	187	100		193	8 65	9.20
Fairfield, Ala. 72	173	187			193		9.20
						-	
Galvesten D4 Houston S2	178	100			198		9.45
		192			203		9,675
Jacksonville M4.			172	213	196**		9.325**
Johnstown B3**.		190		414			9.20
Joliet, Ill. 45		187					
Kokomo C9*	175	189			195°	8.75	9.30*
L. Angeles B2***	12344	122**					
Kansas City S2°.		192		217	198"		9.45°
Minnequa C6†	178	192			1981		9.451
Monessen P6					193		9.20
Pal mer, Mass. W6							9.50*
Pittsburg, Cal. C7	192	210			213		10.15
Rankin, Pa. 45	173	187			193		9.20
So. Chicago R3	173	187			193		9.20
S. San Fran. Cot				236		9.60	10.151
SparrowsPt. B3**	175				198	8.75	9.425
Sterling, Ill. N4 ***	175	192	172	214	198	8.75	9.425
Struthers, O. Y/1							
Worcester A5						8.95	9.50
Williamsport S5.							

* Zinc less than .10¢. * 11-12¢ zinc. * 10¢ zinc. † Plus zinc extras. ‡ Wholesalers only. C-R SPRING STEEL

		CARB	ON CO	NTEN	Г
Conts Per Lb F.o.b. Mill		0.41- 0.60		0.81- 1.05	1.86-
Baltimore, Md. T8		10.70	12,90	15,90	18.85
Bristel, Conn. W12		10.70	12.90	16.10	19.38
Boston T8	9.50	10.70		15.90	18.85
Buffalo, N. Y. R7		10.40		15.60	18.55
Carnegie, Pa. 59		10.40		15,60	18.55
Cleveland A5		10.40		15.60	18.55
Dearborn S1		10.50			
Detroit D1		10.50		15.70	
Detroit D2		10.50			
Dover, O. G4		10.40		15.60	18.55
Evanston, Ill. M8		10.40			
Franklin Park, III. 78.		10.40			18.55
Harrison, N. J. Cll			12.90	16.10	
Indianapolis J3		10.55		15.60	18.55
Los Angeles C1		12.60		17.80	125755
New Britain, Conn. 57.		10.70		15.90	18.85
New Castle, Pa. B4		10.40		15.60	
New Haven, Conn. D1.		10.70		15.90	111111
Pawtucket, R. I. N7		10.70		15.90	18.85
Riverdale, Ill. Al		10.40		15.60	18.55
Sharon, Pa. Sl	. 8.95	10.40	12.60	15.60	18.55
Trenton, R4			12.90	16.10	19.30
Wallingford W1	. 9.46		12.90	15.90	18.55
Warren, Ohio T4			12.60	15.60	18.75
Worcester, Mass. 45			12.90	15.90	18.85
Youngatown J3	. 8.95	10.40	12.60	15.60	18.55

BOILER TUBES

\$ per 100 ft. carload lots.	Si	ine	Seas	nless	Elec. Weld
cut 10 to 24 ft. F.e.b. Mill	OD- ln.	B.W. Ga.	H.R.	C.D.	H.R.
Babcock & Wilcox.	2 23/2 3 33/2 4	13 12 12 12 11	36,34 48,94 56,51 65,97 87,61	42.56 57.31 66.18 77.25 102.50	35, 22 47, 43 54, 77 63, 93 85, 53
National Tube	2 23/2 3 33/2 4	13 12 12 11 10	36.34 48.94 56.51 65.97 87.61	42.56 57.31 66.18 77.25 102.59	35, 22 47, 43 54, 77 63, 93 85, 53
Pittaburgh Steel	2 23/2 3 33/2 4	13 12 12 11 10	36.34 48.94 56.51 65.97 87.61	57.31 66.18 77.25	

133

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdaboro, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3.	62.00	62.50°			
Birmingham W9.	62.80	62.50°	66.50		
Birmingham U4	62.00	62.50°	66.50		
Buffalo R3	66.80	66.50	67.00	67.50	
Buffalo HI	66.00	66,50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50		
Chicago I4	66.00	66.58	66.50	67 00	
Cleveland 45	66.00	66.50	66.50	67.00	71.00
Cleveland R3	66.00	66.50	66.50	67.80	
Duluth 14	66.00	66.58	56.50	67.00	71.00
Erie 14	66.00	66.50	66.50	67.00	71.00
Everett M6	67.50	68.00	68.50		
Fontana K1	75.00	75.50			
Geneva, Utah C7	66.00	66.50			
Granite City G2.	67.90	68.40	68.90		
Hubbard Y/			66.50		
Ironton, Utah C7	66,88	66.50			
Midland C//	66.00				
Minnegua C6	68 00	68.50	69.00		
Monessen P6	66.00				
Neville Ia. Pf	66.00	66.50	66.50	67.00	71.00
N. Tonawanda T/		66 50	67.00	67.50	
Sharpaville S3	66,00		66.50	67.00	
So Chicago R3	66.00	66,50	66.50	67.00	
So. Chicago W8.	66.00		66.50	67.00	
Swedeland A2	68.00	68.50	69.00	69.50	
Toledo /4	66.00	66.50	66.50	67.00	
Troy, N. Y. R3	68.00	68.50	69.60	69.50	74.00
Youngstown Y/	00.00	00.30	66.50	67.00	

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pet allicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct mannanese or portion thereof over 1 pct, 32 per ton fer 0.50 to 0.75 pct nickel, 51 for each additional 0.25 pct nickel, Add 51.00 for 0.31-0.69 pct phos.

Silvery Iran: Baffale (6 pct), 411, 579-25; Jackson J. 1, 46 (Globe Div.), 378.00; Ningare Falls (15.01-15.50), 3101.00; Keekuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add 51.90 per ton for each 0.50 pct allicon over base (6.01 to 6.50 pct) up to 18 pct, Add 51.25 for each 0.50 pct manganese over 1.00 pct. Beassemer silvery pig iron (under .10 pct phos.); 344.00. Add 31.00 premium for all grades silvery to 13 pct.

1 Intermediate low phos.

† Intermediate low phas.

Product	201	202	301	382	363	304	316	321	347	483	410	416	438
Ingots, reroll.	22.00	23.75	23.25	25.25	-	27.60	39.75	32.25	37.80	-	16.75	-	17.00
Slahs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	-	21.50	-	21.75
Billets, forging	-	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	-	55.00	80.75	65.50	79.25	48.25	40.25	-	40.75
Strip, hot-rolled	36.00	39.80	37.25	40.50	-	44.25	69.25	53.50	63.50	-	31.00	-	32.00
itrip, cold-rolled	45.00	49.25	47.50	52.00	-	55.00	80.75	65.50	79.25	48.25	40.25	-	40.75
Vire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.59	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2. Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., 12; Detroit, M2.

Strte: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9, McKeeaport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3, Bridgeville, Pa., U2; Dettoit, M2; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, J3; Sharon, Pa., S1; Butler, Pa., M2; Wallingford, Conn., U3 (plus further conversion catrav); W1 (.25¢ per lb higher); New Bedford, Mass., R6; Gary, U1 (.25¢ per lb higher).

Bar: Baltimore, A7; S. Duquesne, Pa., UI; Munhall, Pa., UI; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., I2; McKeesport, Pa., UI, FI Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5, S. Chicago, UI; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5, R3; Ft, Wayne, I4; Detroit, R5; Gary, UI; Owenboro, Ky., G5; Bridgeport, Conn., NB.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A1; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, CI1; S. Chicago, UI.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown; A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Vandergrift, Pa., U1; Gary, U1.

Forging billets: Midland, Pa., CII; Baltimore, AI; Washington, Pa., J2; McKeesport, FI; Massillon, Canton, O., R5; Watervliet, A3; Pittsburgh, Chicago, UI: Syracuse, CII; Detroit, R5; Munhall, Pa., S. Chicago, UI; Owensboro, Ky., G5; Bridgeport, Conn., N8.

(Effective June 23, 1958)

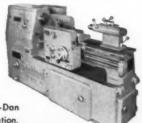
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This single-spindle, high speed threading machine is setting new records for precision threading. Utilizing a single carbide pointed tool, the machine can be set for constant or diminishing feed per pass. Versatile, the Cri-Dan "B" handles many specialized threading jobs beyond the capacity of ordinary threaders.

CRI-DAN "B" 4" x 36"



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CLEVELAND 11, OHIO . U.S.A.

FERROALLOY PRICES

FERROALLOT PRICES		
Ferrochrome Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max Si. 0.02% C. 41.00 0.50% C. 38.00 0.05% C. 39.00 1.00% C. 37.75 0.10% C. 38.50 1.50% C. 37.50 0.20% C. 38.25 2.00% C. 37.25 4.00-4.50% C, 60-70% Cr, 1-2% Si. 28.75 3.50-5.00% C 57-64% Cr, 2.00-4.50% Si. 27.50 0.025% C (Simplex) 36.75 0.10% C, 52-57% Cr, 2.00% max Si. 37.50 7-8½% max C, 50-55% Cr, 3-6% 22.50 7-8½% max C, 50-55% Cr, 3-6% Si. 22.50	Spiegeleisen Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa. Manganese Silicon 16 to 19% 3% max. \$100.50 19 to 21% 3% max. 102.50 21 to 23% 3% max. 105.00 Manganese Metal 2 ln. x down, cents per pound of metal delivered. 95.59% min. Mn, 0.2% max. C, 1% max. SI, 2.5% max. Fe. Carload, packed 45.75 Ton lots 47.25	Alsifer, 29% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb. Carloads, bulk
High Nitrogen Ferrochrome Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N. Chromium Metal Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr. 1% max.	Flo.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound. Carloads 34.00 Ton lots 36.00 250 to 1999 lb 38.00 Premium for Hydrogen - removed metal 0.75	plus Ta \$3.80 Ferromolybdenum, 55-75%, 200- lb containers, f.o.b. Langeloth, Pa., per pound contained Mo. \$1.68 Ferrophosphorus, electric, 23- 26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton \$120.00 10 tons to less carload \$131.00
Fe. 0.10% max. C	Medium Carbon Ferromanganese Mn 80 to 85%, C 1.25 to 1.50, SI 1.50% max., carloads, lump, bulk, delivered, per lib of contained Mn	Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falla, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti
Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh. Ton lots	ton, freight allowed to normal trade area. St 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00. Silicon Metal Cents per pound contained St, lump size, delivered, packed. Ton lots, packed packed 96.75% St 1.25% Fe 24.20 22.90 98% St, 0.75% Fe 24.95 23.65	12-15%, del'd lump, bulk- carloads
Si, 8-11% Mn, packed. Carload lots 18.45 Ton lots 19.95 Less ton lots 21.20 Graphidox No. 4 Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%. Carload packed 19.20 Ton lots to carload packed 21.15 Less ton lots 22.40 Ferromanganese	Cents per pound of briquets, bulk, de- Ilvered, 40% Si, 2 lb Si, briquets. Carloads, bulk	Less ton lots, per pound
Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Producing Point Cents per-lb Marietta, Ashtabula, O.: Alloy, W. Va.; Sheffield, Ala.; Portland, Ors. Johnstown, Pa. 12.25 Neville Island, Pa 12.25 Sheridan, Pa. 12.25 Sheridan, Pa. 12.25 Shuquesne 12.25 S. Duquesne 12.25 Add or substract 0.1¢ for each 1 pct Mn	Ferrovanadium 50-55% V delivered, per pound, contained V, in any quantity. Openhearth 3.20 Crucible 3.30 High speed steel (Primos) 3.40 Calcium Metal Eastern zone, cents per pound of metal,	19% min. B
Add or substract 0.1% for each 1 pet ain above or below base content. Briquets, delivered, 66 pet Mn: Carloads, bulk	delivered. Cast Turnings Distilled Ton lots \$2.05 \$2.95 \$3.75 100 to 1999 lb. 2.40 3.30 4.55	Mickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Sl, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

(Effective June 23, 1958)



MACLEOD

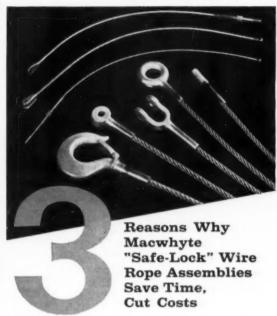


BLAST CLEANING EQUIPMENT

NEW! HIGH-SPEED "Rapid-Blast" MACLEOD Blast Cleaning Cabinet

The Brand New Type AL "Rapid-Blast" Cabinet is specifically designed for high rate of continuous automatic production. Also a complete line of rooms, machines and dust arresters. Over 60 years experience designing and building special equipment. Write for descriptive literature on MACLEOD Blast Cleaning Rooms, Cabinets, and Machines.





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You save time and cut costs because assemblies arrive ready-made for fast, easy installation. Assemblies are precision-made to your specifications in any length and with the strength and flexibility you need—with swaged terminals at one or both ends.

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protect the good name of your equipment. They are made PREformed
to shrug off strain, abrasion, and
shock. Ropes are Bright Steel, Galvanized, or Stainless Steel, Monel
Metal, or Plastic Coated to resist
moisture and corrosion. Swaged terminals have the same holding power
as the wire rope itself.

Macwhyte service cuts delivery and production delays — enables you to pre-determine costs. Many standard types are catalogued for fast delivery. You get prompt service on specials.

Why slow down your production with costly handmade ill-fitting assemblies? Macwhyte can supply the exact standard or special "Safe-Lock" Wire Rope Assembly you need — fast and at lower cost! Write for catalog No. 5601. Do it today!



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SPECIAL STANDARD GAUGE CARS

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40 Cebic Feet 40- and 50-Ton Capacity SIDE DUMP CARS 6-Air-operated, Austin-Westers 30-Cubic Yard 3 Drop and 3 Lift Door Type

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6,000- 8,000- and 10,000-Gallon Cleaned and Tested

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11-600 a.-15000 V-F100-100 MVA. I.C. in cubicle. 24x50x114. Sol. 250 V. 3-600 a.-15000 V-F-100-100 MVA. I.C. in cubicle-36x54x116-Manual. 1-600 a.-15000 V-B-20-B 150 MVA. I.C. Draw out cubicle—Sol. operated. Many others.

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THE CLEARING HOUSE

Chicago Market In Low Gear

Used and rebuilt equipment activity is generally sluggish in Midwest.

One bright spot is strength in the volume of "as is" trading.

Another is the volume of inquiries, which continues high in spite of the generally off market.

· Machine tool rebuilding continues low in Chicago. With backlogs down, work forces reduced by as much as 50 pct, rebuilders of used machine tools aren't viewing the approach of July with any great hope. Normally, late June, July. and August, see an upward surge in rebuilding as manufacturers prepare for the fall cycle. There's been little indication of this thus far.

It's true that inquiries regarding rebuild jobs are at a fairly strong rate. This could be regarded as a hopeful sign. As one rebuilder pointed out, "We've had more paper in the last 30 days than we've had all year. But it's not producing any orders."

Bright Spot-The difficulty in rebuild work is at direct variance with sales of "as is" and reconditioned tools. Used machine tools moving direct from the dealer are in heavy volume, and a number of dealers are building inventories in expectation of heavier business at even better prices during early fall.

May, for example, was the strongest month this year for a number of firms along Machinery Row. June has seen a somewhat more violent fluctuation in business levels, but should shape up to the June level or very near it. Fabricating equipment and tool room equipment are moving in heaviest volume. But it's worth noting that. for the first time this year, dealers are able to get their hands on some heavy production equipment, and are willing to put this heavier equipment into stock for sale this fall.

Prices Firm-Another reason for the surprisingly strong spring volume of "as is" business this year: A larger amount of equipment has become available to the dealer than he was able to pick up for resale in 1957. For example, one dealer who has done his heaviest selling of the year in the past 45 days, reports that he also did his heaviest buying of equipment at auction in the same period. His volume has been strong enough that his overall store inventory has shown no gain during the month-and-a-half period.

Prices are surprisingly firm on "as is" and reconditioned equipment. Most observers who've seen what's happened to the level of business generally had expected used tool prices to soften considerably. They haven't. Even at the rebuilder level, where business has been relatively poorer, there has been little price cutting. Where some price-shaving has been accomplished, this will become much more difficult. Some rebuild shops are faced with wage increases that will certainly have to be passed on to the buyer some time during the late summer

All in all, the used machinery business is suffering somewhat in sympathy with general business conditions throughout the area. But it's hoped the worst is over.

CONSIDER GOOD USED EQUIPMENT

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Model #122-PX-60 Logemann, Baling Chamber 60

Model \$122-FA
\$14 x 18"

BENDER & STRAIGHTEMER

Pels Type JH All Steel Hender & Straightener for

Beams, Channels, Angles, Tees-Angles Equal &

Tees \$1 x 1 \(\frac{1}{2} \)

BENDING ROLLS

" & " Bettach Initial Type

" & " Bettach Initial Type

ANREST STATE OF THE PROPERTY O ECTRIC TRAVELING
56" Span 229/3/69
76" Span 239 Volt D.C.
46" Span 230 Volt D.C.
55" Span 229/3/69
38" Span 239 Volt D.C.
48" Span 239 Volt D.C.
54" Span 239 Volt D.C.
58" Span 239 Volt D.C.
71" Span 239/3/69

Waterbury Farrel D8 OD, Capacity 5/16"
\$250C Manville 88 BD, Capacity %"
EVFEERS—ROLLER
ROLLER
ROLLER
Newboldt, 9 Bolls 4" dia.
Newboldt, 9 Bolls 4" x 36"
New Bolls 4

SHEAR—ALLIGATOR
NO. 4 Mests BH LK, Capacity 2" x 12"
SHEAR—ANGLE
6 x 6 x %" Billies & Jones
SHEAR—6ATE
10" x 1" Hilles & Jones
SHEAR—INE .020 Ga. Hallden Shear Line -ROTARY

HEAR—ROTARY
#750 Kling, 48" Throat, %" Capacity—LATE
HEARM—ROTARY
#750 Kling, 48" Throat, %" Capacity—LATE
HEARM—SQUARING
6" x 14 Ga. Edwards, Motor Drive—LATE
10" x %" Cincinnati
10" x %" Niagars
14 x 3/16" Cincinnati
110" x %" Niagars
14 x 3/16" Cincinnati
110" X %" Niagars
12" Wean Siltting Line
48" Wean Silting Line
48" Wean Silting Line
48" Wean Silting Line
48" Wean Silting Line
49" Medar 2 Roll, Capacity 4" - 14" Bass
80.0 Medar 2 Roll, Capacity 4" - 14" Bass
80.0 Length Hydraulic Feed, LATE
TESTING MACHINES
5.000 b. Baldwin Southwark Compression
100,000 lb. Tinius Olen Universal
WIRE DRAWING MACHINE

50,000 lb. Baldwin Southwark Compression 100,000 lb. Trinus Olsen Universal WIRE DRAWING MACHINE Type B Morgan 4-Block, Capp. #5 Bod down Synere Bls-11 Fine Wire Drawing Machine with Spooler. Capable of starting size .028" dis., finish .003"

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SYNCHRONOUS MOTORS 3-Phase-60 Cycle

Qu.	HP	Make	P.F.	Volts R.	P.M.
1	1750	G.E.	100	2200	3600
1	1500	G. 10.	80	4150/2400	900
1	1500	Whae.	80	2300	514
2 (ne		Whao.	80	4160	430
1	9 20	G. E.	80	2200/440	300
1	700	El. Mchy.	100	440	200
1	450	Whse.	100	2200	128
2	350	G.B.	100	2300	900
1	800	Whae.	80	2300	900
1	306	G.E.	800	2200/440	600

-G.E., O.I.S.C., 2500 K.V.A. Transformers 3 phase, 90 cycle, 14490/13110 V. Prim., 2300/4900-Y Sec. (Very late type.) (immediate Shipment from Seattle.)

SWITCHGEAR IN CUBICLES

Magnetically operated breakers Draw-out Type

(1)—Whee 1200 Amp. Air Breaker, type 75 DH., 7.2 K.Y., 500 M.V.A., Ini. cap., (5)—G. E. X.Y., 500 M.V.A., Ini. cap., (5)—G. E. X.Y., 500 M.V.A., Air Breakers, type AM, (5)—G. E. X.Y., 100 M.V.A., Air Breakers, type AM, (6)—Whee, 600 Amp., 0.C. E. C. Y.D. B. 26 A. 13.8 K.Y., 250 M.V.A., Ini. Cap. (2)—Whee, 600 Amp., 0.C. B's, type F-100, 15 K.V., 100 M.V.A., Ini. Cap., 0.C. E's., type FKR-225, 15 K.Y., 150 M.V.A., Ini. Cap.

OUTDOOR OIL CIRCUIT BREAKERS 3-Pole-Electrically Operated

Qu.	Amps.	KV	Make	Type	Int. Cap.
1	400	73	Whee.	G-11	500-MVA
1	600	69	G.E.	FK-339	500-MVA
1	600	37	G.B.	FHKO-236	500-MVA
1	600	34.5	Al.Ch.	FZO-50-34X	250-MVA
1	400	37	G.E.	FHKO-136	250-MVA
1	400	15	G.E.	FHKO-136	300-MVA
	0.00	24 4	C3. 38	WT () 14 4 4	GEO NAME A

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THE IRON AGE, June 26, 1958



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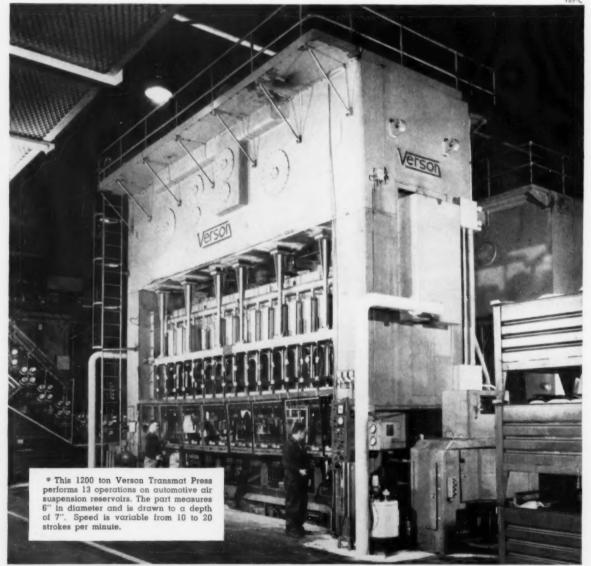


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